

PFAS Sampling Report

TRC - Methanex Sites

PFAS Sampling Report

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Client: Taranaki Regional Council

Co No.: N/A

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1.0 Introduction

This report has been prepared for Taranaki Regional Council (TRC) by AECOM New Zealand Limited (AECOM) in accordance with the proposal dated 11 July 2018. It documents sampling for per- and poly-fluoroalkyl substances (PFAS) undertaken from 21 to 23 August 2018 which comprised sampling of groundwater from selected monitoring wells at the following Methanex New Zealand Limited (Methanex) sites (the Sites): Motunui, Waitara Valley, Omata Tank Farms 1 and 2, and Port Taranaki.

The locations of the Sites are presented on **Figure 1**.

1.1 Objective

The objective of the sampling was to undertake an initial screen for the presence of PFAS in groundwater at the Sites.

2.0 Site Information

Location details for the Sites are summarised in **Table 1** below.

Table 1 Site Information

Site name	Sample IDs	Site address	Map reference (NZTM)
Motunui	GW21 GW22 GW31 GW33 GW37 ¹ Control01	409 Main N Rd, Motunui	1711211E, 5683566N
Waitara Valley	GW3 GW5 GW8A GW10 GW46 GW47 Control02	184 Mamaku Road, Brixton	1708069E, 5679632N
Omata Tank Farm 1	GWOM1	315 Centennial Drive, Omata	1688166E, 5675594N
Omata Tank Farm 2	GW28 GW29	251 Centennial Drive, Omata	1688179E, 56746004N
Port Taranaki tank farm	GW9AA ² GW9B	198 Breakwater Road, Port Taranaki	1689077E, 5676491N

Notes:

NZTM – New Zealand Transverse Mercator

Site layout plans for the Motunui, Waitara Valley, Omata Tank Farm and Port Taranaki Tank Farm sites are presented in **Figures 2 to 5**.

¹ Monitoring well MW41 was originally selected but was unable to be sampled as it had collapsed; well MW37 was sampled instead.

² Monitoring well 9A was under water following overnight rain and therefore inaccessible; alternative well MW9AA was sampled instead.

3.0 Field Works

3.1 Laboratory Selection

TRC engaged AsureQuality Limited (AsureQuality) to complete PFAS analysis, at their Lower Hutt laboratory. AsureQuality is an ISO17025 accredited laboratory and was the only provider of PFAS analysis in New Zealand at the time the field works were undertaken. AsureQuality's PFAS methods comply with the Heads of Environmental Protection Authorities Australia and New Zealand (HEPA) PFAS National Environmental Management Plan, January 2018 (NEMP) and the United States Department of Defence (US DOD)/Department of Energy Quality Systems Manual for Environmental Laboratories.

3.2 Scope of Work

Sampling was undertaken on 21 to 23 August 2018, and comprised:

- Volatile organic compounds (VOC) concentrations in the headspace of each monitoring well were measured immediately after opening each well prior to sampling, using a photo-ionisation detector (PID).
- The total well depth, depth to groundwater, and the presence/absence of light non-aqueous phase liquid (LNAPL) were gauged using an electronic oil-water interface probe in each of the monitoring wells.
- Prior to sampling, groundwater was purged from the monitoring wells using the 'low flow' method to minimise turbidity³. The wells were purged for 15 to 25 minutes at approximate rates of 0.1 L/m, until field screening of the extracted groundwater for pH, temperature, electrical conductivity, oxidation/reduction potential, and dissolved oxygen, indicated that these parameters had stabilised. Turbidity was also monitored during purging. Between 1.5 L and 2.5 L of groundwater was purged from each well using dedicated high-density polyethylene (HDPE) and silicone tubing. Groundwater samples were then collected by pumping groundwater from approximately 0.5 metres (m) below static water level into laboratory prepared bottles⁴. The groundwater sampling field sheets are presented in **Appendix A**.
- The bottles were placed into chilled storage bins and sent to AsureQuality under AECOM chain of custody procedures, where they were analysed for PFAS. Chain of custody documentation is provided in **Appendix B**.
- Appropriate isolation and decontamination procedures were undertaken during sampling as per AECOM PFAS sampling protocols, with special care taken to eliminate the potential for contamination of sampling equipment, materials, and water samples with PFAS. AECOM PFAS sampling protocols have been developed in accordance with US DOD⁵, United States Environmental Protection Agency (US EPA)⁶ and United States Navy⁷ guidance documents, and include the use of a two-person team for groundwater sampling ("clean hands, dirty hands") in general accordance with US EPA Method 1669⁸, where "clean hands" handle only sample bottles during sampling and "dirty hands" handle equipment.

³ Low flow purging could not be completed at well GW29 (Omata Tank Farm 2) as there was an insufficient pump tubing remaining at the end of the sampling event. Approximately 1 well volume of groundwater was purged with a PVC bailer.

⁴ A grab sample was collected by bailer from monitoring well GW29 (Omata Tank Farm 1).

⁵ Department of Defence, United States (DoD), October 2016. Bottle Selection and Other Sampling Considerations When Sampling for Per- and Poly-Fluoroalkyl Substances (PFAS).

⁶ US EPA, January 2010. USEPA Document EQASOP-GW 001, Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, Version 3.

⁷ US Navy, September 2015. Field Sampling Protocols to Avoid Cross-contamination During Water Sampling for Perfluorinated Compounds (PFCs), Navy Guidance Document.

⁸ Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, United States Environmental Protection Agency, July 1996.

- For quality assurance/quality control (QA/QC) purposes, the following samples were collected and analysed as described:
 - Duplicate groundwater sample QAQC01, collected from monitoring well Control01 (Motunui) during 'low flow' groundwater sampling, analysed for PFAS.
 - Field blank sample QAQC02, collected by filling sample bottle with laboratory supplied Type 1 reagent water near monitoring well Control01 (Motunui), not analysed.
 - Equipment blank sample QAQC03, collected by pouring laboratory supplied Type 1 reagent water over the oil-water interface probe and into a laboratory supplied sample bottle, after decontaminating the probe upon completion of groundwater sampling at Motunui, not analysed.
 - Trip blank sample QAQC04, laboratory supplied Type 1 reagent water in sealed laboratory supplied bottle, included in the chilled storage bin prior to dispatching the groundwater samples for Motunui and Waitara Valley to AsureQuality in August 2018, analysed for PFAS.
 - Duplicate groundwater sample QAQC05, collected from monitoring well Control02 (Waitara Valley) during 'low flow' groundwater sampling, analysed for PFAS.
 - Field blank sample QAQC06, collected by filling sample bottle with laboratory supplied Type 1 reagent water near monitoring well Control02 (Waitara Valley), not analysed.
 - Equipment blank sample QAQC07, collected by pouring laboratory supplied Type 1 reagent water over the oil-water interface probe and into a laboratory supplied sample bottle, after decontaminating the probe upon completion of groundwater sampling at Waitara Valley, not analysed.
 - Duplicate groundwater sample QAQC08, collected from monitoring well GW9B (Port Taranaki) during 'low flow' groundwater sampling, analysed for PFAS.
 - Field blank sample QAQC09, collected by filling sample bottle with laboratory supplied Type 1 reagent water near monitoring well GW9B (Port Taranaki), not analysed.
 - Equipment blank sample QAQC10, collected by pouring laboratory supplied Type 1 reagent water over the oil-water interface probe and into a laboratory supplied sample bottle, after decontaminating the probe upon completion of groundwater sampling at Port Taranaki, not analysed.
- Purge water and decontamination water was containerised and relinquished into the custody of the Methanex laboratory staff.

4.0 Results

4.1 Groundwater Levels and Flow

Depth to groundwater measured during the August 2018 sampling event are presented in **Table 2**. Reduced groundwater levels are also presented for Waitara Valley, where top-of-casing (TOC) elevations were provided by TRC.

At Motunui, standing water levels ranged from 5.123 m below TOC (bTOC) at GW37 to 7.190 m bTOC at GW22.

At Omata Tank Farms 1 and 2 standing water levels ranged from 1.838 m bTOC at GWOM1 (Omata Tank Farm 1) to 9.018 m bTOC at GW29 (Omata Tank Farm 2).

At Port Taranaki, standing water levels ranged from 1.679 m bTOC at GW9B to 2.221 m bTOC at GW9AA.

At Waitara Valley, groundwater ranged between 0.999 m bTOC and 8.5 m bTOC. The inferred groundwater flow pattern based on the gauging data at Waitara Valley for August 2018 is presented in **Figure 6**. The data indicate shallow groundwater flows in a northeasterly direction towards the

Waitara River at a gradient ranging from approximately 0.03 m/m in the northern part of the site to approximately 0.05 m/m in the southern part of the site.

4.2 Field Observations

Monitoring well MW41 (Motunui) had been initially selected for sampling, but prior to the start of field works, AECOM was advised by Methanex that the well had collapsed. In its place, well MW37 (Motunui) was selected by TRC for sampling.

Monitoring well 9A (Port Taranaki), which had been initially selected for sampling, was under water following overnight rain and therefore inaccessible; alternative well MW9AA (Port Taranaki) was sampled in its place.

No foam or other visual evidence of PFAS presence was observed in groundwater during gauging, purging and sampling of any of the monitoring wells.

Headspace VOCs measured 6.3 parts per million (ppm) at monitoring well GW9AA (Port Taranaki), and an organic, marine odour was noted during gauging, purging and sampling of the well. Headspace VOCs measured in the other groundwater wells ranged from 0.0 ppm to 0.3 ppm.

The sealed wellheads were submerged in surface water accumulated in the manhole vaults at monitoring wells 9AA and 9B (Port Taranaki), and this water was bailed out prior to sampling to prevent entry of the surface water into the well. A sheen was also noted on the surface water in the manhole vault at monitoring well 9AA (Port Taranaki).

4.3 Analytical Results

The groundwater analytical results are presented in **Table 3**. The following points are noted:

- Motunui
 - Perfluorooctanoic acid (PFOA) was detected in the groundwater samples collected from GW21, GW22, GW31, and GW33 at concentrations of 0.017 µg/L, 0.0029 µg/L, 0.094 µg/L, and 0.67 µg/L, respectively.
 - PFAS were not detected above laboratory limits of reporting (LORs) in the samples collected from GW37 or Control01.
- Waitara Valley
 - PFOA was detected in groundwater samples collected from GW8A and GW10 at concentrations of 0.004 µg/L and 0.0081 µg/L, respectively.
 - PFAS were not detected above the LORs in the sample collected from GW3.
 - PFAS were not detected in the groundwater samples collected from GW5, GW46, GW47, or Control02 above the higher laboratory LOR (0.010 µg/L) applied to these samples due to their high turbidity.
- Omata Tank Farms 1 and 2
 - PFOA was detected in the groundwater sample collected from GWOM1 (Omata Tank Farm 1) at a concentration of 0.0046 µg/L; perfluorohexane sulfonic acid (PFHxS) and perfluorooctane sulfonic acid (PFOS) were not detected above laboratory LORs in this sample.
 - PFHxS, PFOS and PFOA were detected in the groundwater samples collected from GW28 and GW29 (Omata Tank Farm 2) at concentrations of 0.015 µg/L and 0.32 µg/L, 0.22 µg/L and 0.42 µg/L, and 0.018 µg/L and 0.044 µg/L respectively.
- Port Taranaki
 - PFOA was detected in the groundwater sample collected from GW9AA at a concentration of 0.020 µg/L; PFHxS and PFOS were not detected above the higher laboratory LOR (0.010 µg/L) applied to this sample due to its high turbidity.

- PFHxS, PFOS, and PFOA were detected in the groundwater sample collected from GW9B at concentrations of 0.015 µg/L, 0.066 µg/L and 0.028 µg/L respectively.

4.3.1 Quality Assurance / Quality Control

Samples were transported to AsureQuality, under AECOM chain of custody procedures, for analysis.

Groundwater samples were collected from Motunui and Waitara Valley on 21 and 22 August 2018 respectively, and were received by AsureQuality on 23 August 2018. Groundwater samples were collected from Omata Tank Farms 1 and 2 and Port Taranaki on 23 August 2018 and were received by AsureQuality on 24 August 2018.

PFAS were not detected above laboratory LORs in the trip blank sample (QAQC 04) submitted with the Motunui and Waitara Valley samples, or the duplicate groundwater samples collected from Control01 (Motunui, QAQC01) and Control02 (Waitara Valley, QAQC05) during groundwater sampling.

The calculated relative percentage difference (RPD⁹) for detected PFAS concentrations reported for the primary and duplicate groundwater samples collected from monitoring well GW9B (Port Taranaki) is presented in **Table 4**. The RPD calculated for the primary and duplicate groundwater samples ranged from 0% to 6% and were within acceptable limits (less than 20%).

AzureQuality indicated that the analysis for samples GW33 (Motunui); GW5, GW46, GW47, Control02, and QAQC05 (Waitara Valley); GW28 (Omata Tank Farm 2); and GW9AA (Port Taranaki) could not achieve a laboratory LOR below 0.1 µg/L owing to the high turbidity of the samples. In order to achieve a lower LOR of 0.01 µg/L for these samples, they were reanalysed using a deviation to the accredited methodology at the request of AECOM.

While accreditation was not possible for all samples due to turbidity, the analytical methods were considered valid for the sample types. Overall, the QA/QC results are assessed to meet the data quality objectives for this investigation.

4.4 Comparison with Interim Guidelines

Groundwater samples have been compared against relevant interim guideline values recommended by the HEPA NEMP, comprising:

- Australian Department of Health 2017 health-based guidance values for drinking and recreation water, with the recreation value selected for offsite recreational users and the drinking water provided for reference only (groundwater is not used for drinking water at the Sites).
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000), with 95% species protection level for PFOS and PFOA selected as appropriate for the Sites and the most-conservative 99% species protection level for PFOS and PFOA provided for reference only. These values were selected for aquatic/benthic organisms.

The NEMP notes that a degree of conservatism has been included in the guidelines values which means that exceeding these values does not constitute a risk if other pathways are controlled. This inbuilt conservatism is necessary when deriving screening values to be protective of communities where multiple exposure pathways may be present.

Guideline values are presented in **Table 3** for comparison purposes. The following points are noted:

- The concentration of PFOA detected in groundwater from GW33 (Motunui) exceeded the interim drinking water guideline value.
- The concentration of PFHxS/PFOS detected in groundwater from GW29 (Omata Tank Farm 2) exceeded the interim guideline values for drinking and recreation water, and the total PFOS concentration detected in groundwater from GW29 exceeded the interim guideline value for 95% freshwater and marine species protection.

All other analytical results are below the applicable interim guideline values for PFAS.

⁹ RPD = (primary result – duplicate result) x 100 / mean result

5.0 Discussion

Based on this initial screening, PFAS are present in groundwater at the Motunui, Waitara Valley, Omata Tank Farms, and Port Taranaki sites.

Though the concentration of PFOA at GW33 (Motunui) exceeded the interim drinking water guideline value for PFOA, this does not represent a risk to human health as the drinking water exposure pathway is considered to be incomplete. The site and surrounding area is served by the New Plymouth District Council municipal water supply, which is sourced from Lake Mangamahoe approximately 20 km southwest and upstream of the site.

PFAS are present in groundwater at the Omata Tank Farm 2 site at concentrations exceeding the interim ANZECC guideline value for 95% freshwater and marine species protection. The ANZECC guidelines values are intended to be applied in a receiving water body. Groundwater beneath the Omata Tank Farm 2 site is inferred to discharge to the Tasman Sea. The potential risk to recreational users of, and ecological receptors in, the Tasman Sea is considered minor/insignificant owing to the dilution factor of the Tasman Sea. Significant dilution occurs when groundwater discharges to coastal water.

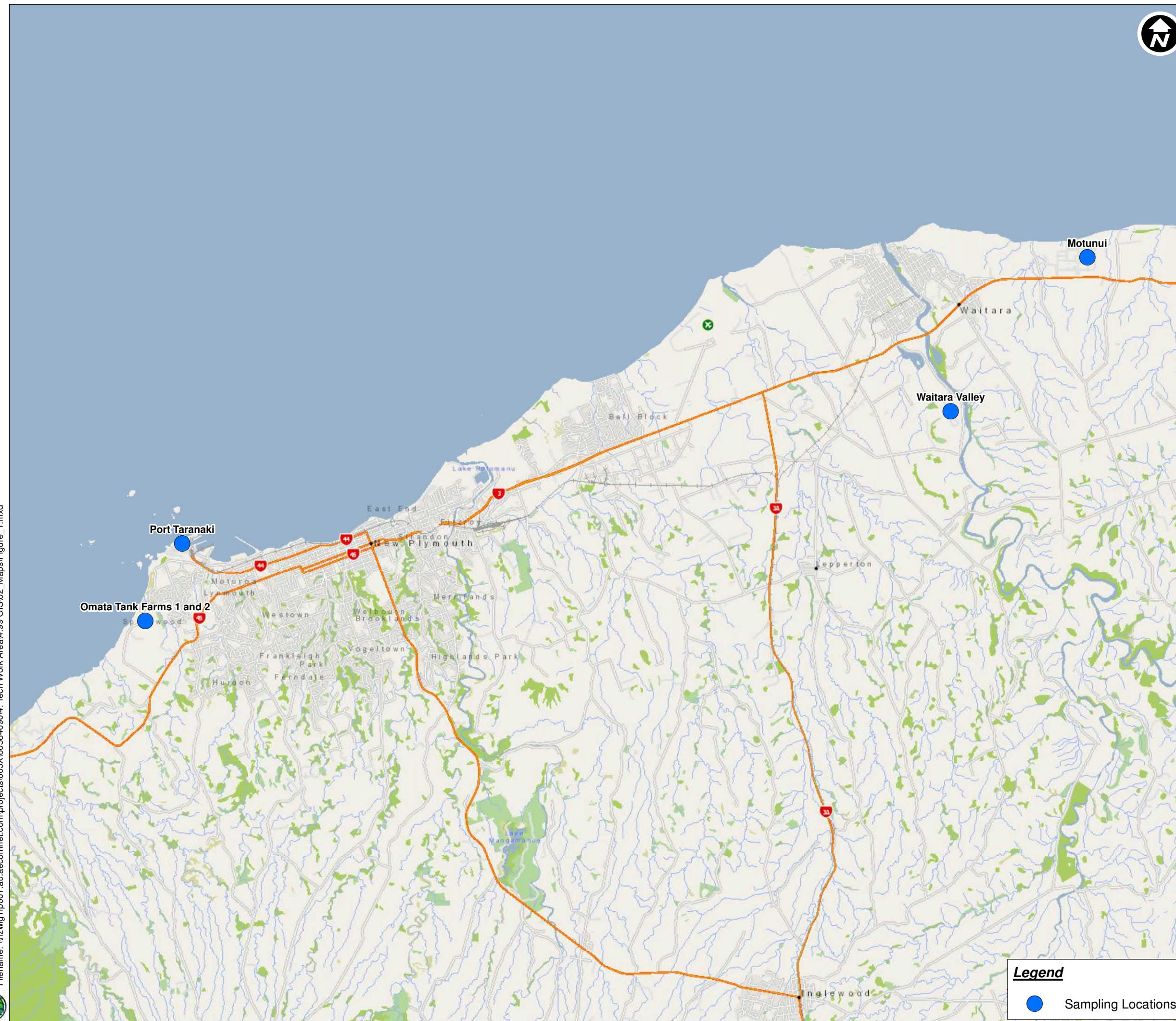
Although PFAS were detected in groundwater, the concentrations in this initial screening indicate it is unlikely there is a significant risk to human health or ecological receptors.

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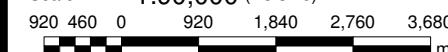


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METHANEX MOTUNUI SITE PLAN

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FIGURE 2

Legend

● Groundwater Monitoring Well Location

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METHANEX OMATA TANK FARMS
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FIGURE 4



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Groundwater Monitoring Well Location



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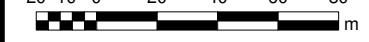
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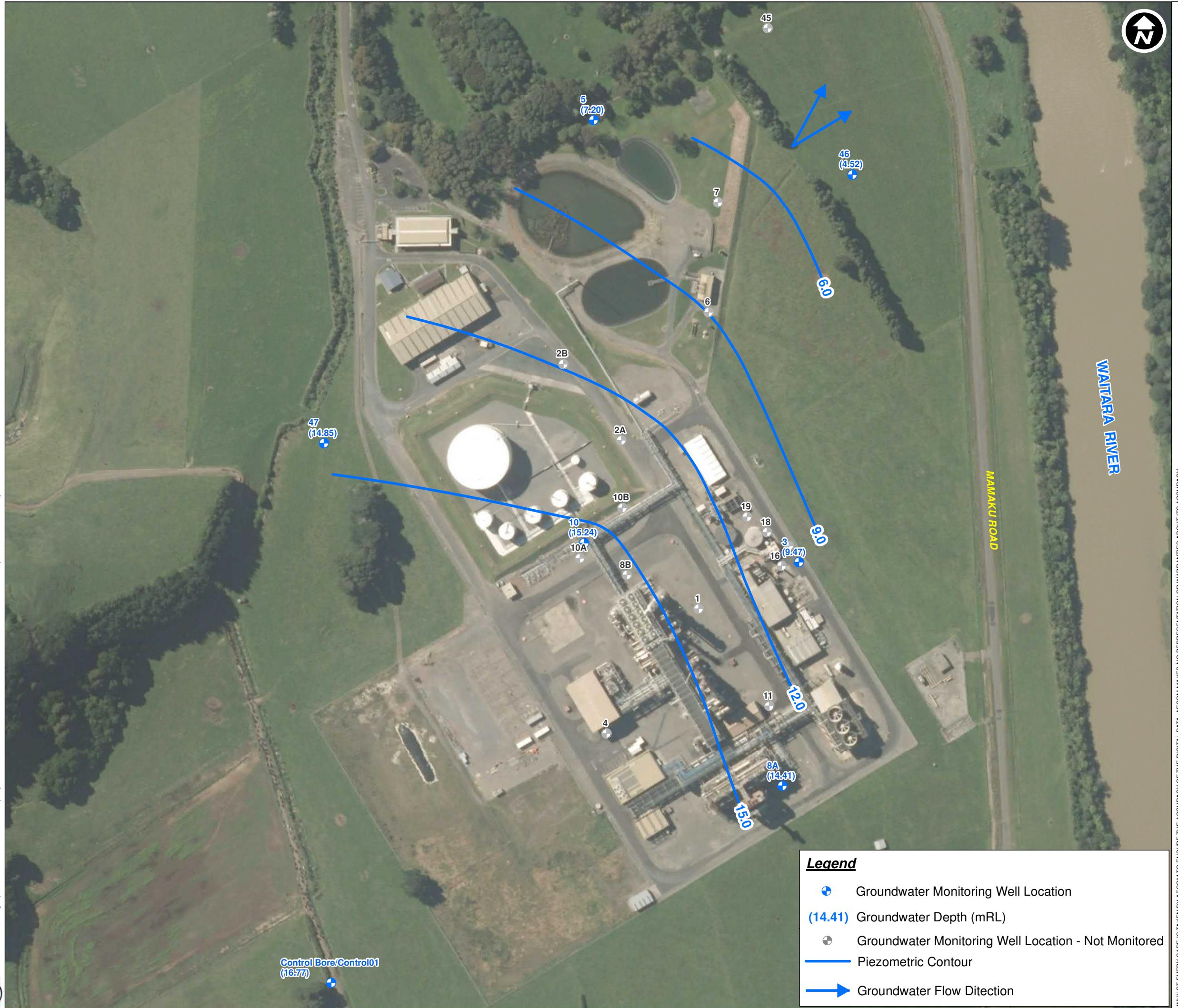
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FIGURE 5

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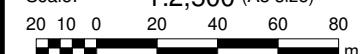


CONSULTANT

AECOM New Zealand Limited
www.aecom.com

SPATIAL REFERENCE

Scale: 1:2,500 (A3 size)



Map features depicted in terms of NZTM 2000 projection.

Data Sources:
Cadastral Boundaries – LINZ NZ Cadastral Dataset 2018

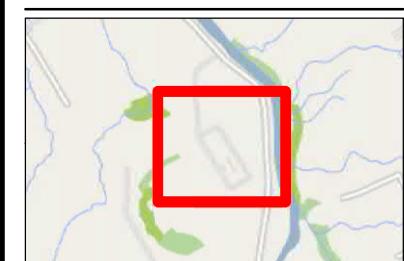
PROJECT MANAGEMENT

Approved	VW	Date 25/10/2018
Checked	VW	Date 25/10/2018
Designed	SS	Date 25/10/2018
Drawn	SS	Date 25/10/2018

ISSUE/REVISION

A	25/10/2018	DRAFT
Rev	Date	Description

KEY PLAN



PROJECT NUMBER

60584690

MAP NUMBER

METHANEX WAITARA VALLEY GROUNDWATER CONTOUR PLAN

FIGURE 6

Tables

Table 2: Groundwater Gauging Data

Well ID	Location	Date	Total Well Depth (m bTOC)	TOC Elevation (m RL) [#]	SWL (m bTOC)	Depth to LNAPL (m BTOC)	Groundwater Elevation (m RL)
GW21	Motonui	21-Aug-18	11.00	-	6.174	ND	-
GW22		21-Aug-18	21.10	-	7.190	ND	-
GW31		21-Aug-18	12.00	-	5.345	ND	-
GW33		21-Aug-18	6.50	-	3.457	ND	-
GW37		21-Aug-18	8.50	-	5.123	ND	-
Control01		21-Aug-18	21.70	-	6.806	ND	-
GW3	Waitara Valley	22-Aug-18	10.02	17.97	8.500	ND	9.47
GW5		22-Aug-18	3.38	8.65	1.447	ND	7.20
GW8A		22-Aug-18	5.40	17.47	3.064	ND	14.41
GW10		22-Aug-18	4.85	16.75	1.512	ND	15.24
GW46		22-Aug-18	7.00	8.83	4.314	ND	4.52
GW47		22-Aug-18	4.00	16.33	1.481	ND	14.85
Control02		22-Aug-18	4.54	17.77	0.999	ND	16.77
GWOM1	Omata Tank Farm 1	23-Aug-18	6.00	-	1.838	ND	-
GW28	Omata Tank Farm 2	23-Aug-18	12.00	-	5.638	ND	-
GW29		23-Aug-18	15.00	-	9.018	ND	-
GW9AA	Port Taranaki	23-Aug-18	4.90	-	2.221	ND	-
GW9B		23-Aug-18	5.83	-	1.679	ND	-

Notes:

SWL = Standing water level (pre-purging)

RL = Reduced level

m = Metres

bTOC = Below top of casing

LNAPL = Light non-aqueous phase liquid

[#]m RL = provided by TRC. Surveyed by Taylor Patrick Surveyors on 23/06/2014. Elevation are in Taranaki Vertical Datum 1970.

ND = Not detected

- = no data or not applicable

Table 3 - Groundwater Analytical Results

	Guideline Values				Sample Details and Analytical Results												
	Human		Ecological		Motunui								Waitara Valley				
Source of Criteria	Australian DoH 2017		ANZECC	Sample Location	GW21	GW22	GW31	GW33*	GW37	Control01		GW3	GW5*	GW8A	GW10		
	Drinking Water	Recreational Water	99% species protection	95% species protection	AECOM Sample Number	18-213689-1	18-213689-2	18-213689-3	18-213689-4	18-213689-5	18-213689-6	18-213620-1	18-213406-1	18-213406-2	18-213406-3	18-213406-4	
Guideline	Date Sampled				Laboratory Sample Reference	18-213689-1	18-213689-2	18-213689-3	18-213689-4	18-213689-5	18-213689-6	18-213620-1	18-213406-1	18-213406-2	18-213406-3	18-213406-4	
Perfluoroalkylsulfonic acids					Perfluoroalkylsulfonic acids												
di-PFHxS	-	-	-	-	di-PFHxS	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
mono-PFHxS	-	-	-	-	mono-PFHxS	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
L-PFHxS	-	-	-	-	L-PFHxS	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
Total PFHxS ¹	-	-	-	-	Total PFHxS ¹	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
di-PFOS	-	-	-	-	di-PFOS	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
mono-PFOS	-	-	-	-	mono-PFOS	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
L-PFOS	-	-	-	-	L-PFOS	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
Total PFOS ²	-	-	0.00023	<u>0.13</u>	Total PFOS ²	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
PFHxS/PFOS ³	0.07	0.7	-	-	PFHxS/PFOS ³	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
Perfluoroalkylcarboxylic acids					Perfluoroalkylcarboxylic acids												
PFOA	0.56	5.6	19	<u>220</u>	PFOA	0.017	0.0029	0.094	0.67	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	0.004	0.0081	
	Guideline Values				Sample Details and Analytical Results												
Receptor	Human		Ecological		Sample Details and Analytical Results												
Source of Criteria	Australian DoH 2017		ANZECC	Sample Location	Waitara Valley			Trip Blank	Omata Tank Farm 2		Omata Tank Farm 1	Port Taranaki					
Guideline	Drinking Water	Recreational Water	99% species protection	95% species protection	Sample Location	GW46*	GW47*	Control02		QAQC04	GW28*	GW29 (Grab Sample)	GWOM1	GW9AA*	GW9B		
	Date Sampled				AECOM Sample Number	18-213406-5	18-213406-6	Control02*	QAQC05*					GW9B	QAQC08		
					Laboratory Sample Reference	18-213406-5	18-213406-6	18-213406-7	18-213620-5	18-213620-4	18-213132-4	18-213132-5	18-213132-1	18-213132-2	18-213132-3	18-213132-6	
Perfluoroalkylsulfonic acids					Perfluoroalkylsulfonic acids												
di-PFHxS	-	-	-	-	di-PFHxS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	< 0.0010	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
mono-PFHxS	-	-	-	-	mono-PFHxS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.05	0.27	< 0.0010	< 0.010	0.0015	0.0015	
L-PFHxS	-	-	-	-	L-PFHxS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.015	0.32	< 0.0010	< 0.010	0.0015	0.0015	
Total PFHxS ¹	-	-	-	-	Total PFHxS ¹	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.015	0.32	< 0.0010	< 0.010	0.0015	0.0015	
di-PFOS	-	-	-	-	di-PFOS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.0065	< 0.0010	< 0.010	< 0.010	< 0.0010	< 0.0010	
mono-PFOS	-	-	-	-	mono-PFOS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.10	< 0.0010	< 0.010	< 0.010	0.0018	0.0017	
L-PFOS	-	-	-	-	L-PFOS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.022	0.31	< 0.0010	< 0.010	0.0048	0.0045	
Total PFOS ²	-	-	0.00023	<u>0.13</u>	Total PFOS ²	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.022	<u>0.42</u>	< 0.0010	< 0.010	0.0066	0.0062	
PFHxS/PFOS ³	0.07	0.7	-	-	PFHxS/PFOS ³	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.037	0.74	< 0.0010	< 0.010	0.0081	0.0077	
Perfluoroalkylcarboxylic acids					Perfluoroalkylcarboxylic acids												
PFOA	0.56	5.6	19	<u>220</u>	PFOA	< 0.010	< 0.010	< 0.010	< 0.010	< 0.0010	0.018	0.044	0.0046	0.020	0.028	0.028	

Notes:

All results and criteria are expressed in units of µg/L.

- no criteria

* Any tests for wells marked with this symbol are not accredited due to turbidity (AsureQuality)

PFHxS = perfluorohexane sulfonic acid

di-PFHxS = total perfluorodimethylbutane sulfonic acids

mono-PFHxS = total perfluoromethylpentane sulfonic acids

L-PFHxS = linear perfluorohexanesulfonic acid

PFOS = perfluoroctane sulfonic acid

di-PFOS = total perfluorodimethylhexane sulfonic acids

mono-PFOS = total perfluoromethylheptane sulfonic acids

L-PFOS = linear perfluorooctanesulfonic acid

PFOA = perfluoroctanoic acid

1. Total PFHxS = The numerical sum of di-PFHxS, mono-PFHxS, and L-PFHxS

2. Total PFOS = The numerical sum of di-PFOS, mono-PFOS, and L-PFOS

3. PFHxS/PFOS = The numerical sum of Total PFHxS and Total PFOS

Sources of Guideline Values:

Australian DoH 2017: Health Based Guidance Values for PFAS for Use in Site Investigations in Australia. Australia Government Department of Health, 2017.

ANZECC: National Water Quality Management Strategy: Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC,2000. Technical draft default guideline values for PFOS and PFO

Table 4: Relative Percentage Difference

Client Name: Taranaki Regional Council
 Project Name: TRC PFAS Sampling - Methanex
 Project No: 60584690

Analyte	Primary Sample	Duplicate	RPD%
	GW9B	QAQC08	
L-PFHxS	0.0015	0.0015	0%
Total PFHxS ¹	0.0015	0.0015	0%
mono-PFOS	0.0018	0.0017	6%
L-PFOS	0.0048	0.0045	6%
Total PFOS ²	0.0066	0.0062	6%
PFHxS/PFOS ³	0.0081	0.0077	5%
PFOA	0.028	0.028	0%

Notes:

All results are expressed in units of µg/L.

RPD: relative percentage difference

RPD calculated only for detected compounds.

PFHxS = perfluorohexane sulfonic acid

di-PFHxS = total perfluorodimethylbutane sulfonic acids

mono-PFHxS = total perfluoromethylpentane sulfonic acids

L-PFHxS = linear perfluorohexanesulfonic acid

PFOS = perfluorooctane sulfonic acid

di-PFOS = total perfluorodimethylhexane sulfonic acids

mono-PFOS = total perfluoromethylheptane sulfonic acids

L-PFOS = linear perfluorooctanesulfonic acid

PFOA = perfluorooctanoic acid

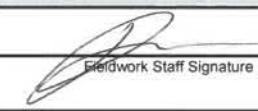
1. Total PFHxS = The numerical sum of di-PFHxS, mono-PFHxS, and L-PFHxS

2. Total PFOS = The numerical sum of di-PFOS, mono-PFOS, and L-PFOS

3. PFHxS/PFOS = The numerical sum of Total PFHxS and Total PFOS

Appendix A

Field Sampling Sheets

Project Name:	TRL-PFAJ SAMPLING	Project Location:	METHANEX		PM Name:	SEAN HUGGENS				
Project Number:	60584690	Client:	TRL		Fieldwork Staff Name:	REBECCA JOYCE				
Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.										
Field Data										
Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOP)	Depth to Groundwater (mBTOP)	LNAPL Thickness (m)	Depth to DNAPL (mBTOP)	Total Well Depth (mBTOP)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
GW21	21/8/18	14:15	0.3	—	6.894	—	—	11.0	—	NVO
GW22	1	15:38	0.0	—	7.190	—	—	21.2	—	NVO
CONTROL01		10:43	0.3	—	6.806	—	—	21.7	—	NVO
GW37		15:00	0.0		5.123	—	—	8.5	—	NVO
GW31		11:54	0.1	—	5.345	—	—	12.0	—	NVO → slight turbidity
GW33	↓	13:17	0.2	—	3.457	—	—	6.5	—	NVO
GW46	22/8/18	09:35	0.1	—	4.314	—	—	7.0	—	NVO
CONTROL02		10:45	0.0	—	0.999	—	—	4.54	—	NVO
GW47		11:30	0.0	—	1.481	—	—	4.0	—	NVO → slightly cloudy
GW3		13:45	0.3	—	8.500	—	—	10.02	—	NVO
GW10		14:30	0.1	—	1.512	—	—	4.85	—	NVO
GW5		15:20	0.0	—	1.447	—	—	3.38	—	NVO
GW8A	↓	16:00	0.0	—	3.064	—	—	5.40	—	NVO
GW9B	23/8/18	08:48	0.0	—	1.679	—	—	5.83	—	NVO
GW9AA		10:30	6.3	—	18882.221	—	—	6204.90	—	organic odour - marine water
GW01		11:35	0.0	—	1.838	—	—	6.0	—	NVO
GW28		12:10	0.0	—	5.638	—	—	12.0	—	NVO
GW29	↓	13:10	0.0	—	9.018	—	—	15.0	—	NVO
Measurement Equipment								Notes/Comments		
Make & Model:	IF63 /PID2	Supplier:	VAN WALT		(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOP) - metres below top of casing					
Serial No.:		Calibration Report Provided?	YES → see attached							
Approval and Distribution										
 Fieldwork Staff Signature				23/8/18	 Project Manager Signature				13/11/18	
Distribution: Project Central File										

FQM - Groundwater Sampling and Purguing Record

Project Name:	TRC (PFA)	Project Number:	605841690	PM Name:	SEAN HUGBENS	Bore ID:	GW 31			
Client:	TRC/METHANEX	Project Location:	M01UNV1	Fieldwork Staff:	RJ + LT	Sample Date:	21/8/18			
General Bore Information				Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.			
Date of GW Level:	21/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	0555	<input type="checkbox"/> Decontaminated	Low Flow Pump rate: 100mL/m	Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):	5.345	Screen Interval (m):	5	Chem Kit Model:		<input type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:		
Bore Depth (m-pvc):	12.0	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	Bailer	Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):		Cover Type (gate/stick up):		(The correction to apply is probe dependent)		<input type="checkbox"/> Other (specify)	Peristaltic Pump	Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):		Bore Locked (YES/NO):		Parameter method:	<input checked="" type="checkbox"/> Downhole		<input type="checkbox"/> Other (specify)		Sampling Start Time:	Hydrasleeve out
Calculated bore volume (L):		Key Type (if applicable):			<input type="checkbox"/> Retrieved				Parameters	
Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):						
Water Quality Parameters										
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	
11:54	0.5	5.4413	100mL/m	7.16	177.4	6.81	-48.4	16.4	NTU \rightarrow 90	NVO \rightarrow water
11:59	1.0	5.460	100mL/m	7.921	178.4	6.93	-44.8	16.4	\rightarrow 150	a little grey
12:04	1.5	5.558	100mL/m	7.29	182.1	6.86	-44.2	16.3	\rightarrow unsettled	in colour
12:09	2.0	5.583	~ 11	6.91	184.0	6.82	-45.0	16.3		? minor turbidity
Acceptable Parameter Range: $\pm 10\%$ $\pm 3\%$ ± 0.05 ± 10 mV ± 0.2 °C										$\pm 10\%$ turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Commets		
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)				Bore volume calculation, bore condition, fate of tubing, redox correction etc.		
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic				# AIR LOCK \rightarrow AIR BUBBLES AROUND TURBIDITY METER		
Approval and Distribution										0.1 ppm \rightarrow background/downhole
Fieldwork Staff Signature		23/8/18	Verifier Signature		13/11/18	Checker Name and Signature		Date		
										
Project Manager Signature		13/11/18	Distribution: Project Central File							

FQM - Groundwater Sampling and Purguing Record

FQM - Groundwater Sampling and Purgung Record

Project Name:	TRL-PFAJ SAMPLING	Project Number:	60584690/2.2	PM Name:	SEAN AUDGENS	Bore ID:	GW 21			
Client:	TRL	Project Location:	MOTUNUI	Fieldwork Staff:	RJ FLT	Sample Date:	21/8/18			
						Well Development or Well Sampling Event? (circle)				
General Bore Information			Parameter Info.		Decontamination	Sampling Method	Hydrasleeve Info.			
Date of GW Level:	21/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	0555	<input checked="" type="checkbox"/> Decontaminated	<input checked="" type="checkbox"/> Low Flow Pump rate: 100ml/m	Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):	6.174	Screen Interval (m):	—	Chem Kit Model:	—	<input checked="" type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:		
Bore Depth (m-pvc):	11.0	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input checked="" type="checkbox"/> Disposable	Bailer	Hydrasleeve Sampling Depth (m-pvc):		
Depth to Product (m-pvc):	—	Cover Type (gaffi/stick up):	—	(The correction to apply is probe dependent)	—	<input checked="" type="checkbox"/> Other (specify)	Peristaltic Pump	Hydrasleeve Gauging		
Product Thickness (m):	—	Bore Locked (YES/NO):	—	Parameter method:	<input checked="" type="checkbox"/> Downhole	<input checked="" type="checkbox"/> Other (specify)	Waterra	Hydrasleeve Hydrasleeve install time:		
Calculated bore volume (L):	—	Key Type (if applicable):	—		<input checked="" type="checkbox"/> Retrieved			Sampling Start Time: Hydrasleeve out		
Includes/ excludes bore annulus (circle)		# purge volumes removed:			Total purged volume (L):				Parameters	
Water Quality Parameters										
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	
14:15	0.5	6.174	100ml/m	7.82	129.2	6.17	21.0	16.1	6.0 NTU \rightarrow N VO	
14:20	1.0	6.223	100ml/m	7.80	127.8	6.18	22.7	16.1	5.41 " "	
14:25	1.5	↓	↓	7.79	127.7	6.18	24.2	16.1	4.8 " \downarrow	
Acceptable Parameter Range:			$\pm 10\%$	$\pm 3\%$	± 0.05	$\pm 10 \text{ mV}$	$\pm 0.2 \text{ }^{\circ}\text{C}$	$\pm 10\%$ turbidity (if using a turbidity meter)		
Analytes Sampled for:		Bottles Collected			QA/QC Information		Field Commets			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.			
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic			0.0 ambient \rightarrow 0.1 ppm downhole.			
Approval and Distribution										
Fieldwork Staff Signature	23/8/18	Checker Name and Signature	13/11/18							
		Vicky NT								
	13/11/18									
Project Manager Signature	Date	Distribution: Project Central File								
	13/11/18									

FQM - Groundwater Sampling and Purging Record

Project Name:	TRL - PFAS	Project Number:	60584690	PM Name:	SEAN HUGGENS	Bore ID:	GW37			
Client:	TRL / METHANEX	Project Location:	MOTUNUI	Fieldwork Staff:	RJ + LT	Sample Date:	21/8/18			
General Bore Information				Parameter Info.	Decontamination	Sampling Method	Hydrasleeve info.			
Date of GW Level:	21/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	0555	<input type="checkbox"/> Decontaminated	Low Flow Pump rate: 100ml/min	Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):	5.094	Screen interval (m):	—	Chem Kit Model:	—	<input type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:		
Bore Depth (m-pvc):	8.5	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	Bailer	Hydrasleeve		
Depth to Product (m-pvc):	—	Cover Type (gated/stick up):	—	(The correction to apply is probe dependent)	—	<input type="checkbox"/> Other (specify)	Peristaltic Pump	Waterra		
Product Thickness (m):	—	Bore Locked (YES/NO):	—	Parameter method:	<input type="checkbox"/> Downhole	<input type="checkbox"/> Other (specify)	Hydrasleeve Install time:	Hydrasleeve in		
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:	Sampling Start Time: Total purged volume (L):						Hydrasleeve out	
Water Quality Parameters										
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	
15:00	0.5	5.123	100ml/min	8.00	207.9	6.70	29.8	18.7	1.6 NTU \rightarrow NV0.	
15:05	1.0	5.124	—	7.94	210.0	6.15	30.1	19.0	1.4 NTU \rightarrow NV0.	
15:10	1.5	—	—	7.81	210.2	6.07	31.8	19.2	1.2 \rightarrow Flow cell in direct sun - warming up.	
15:20	2.0	—	—	7.81	209.3	6.03	33.6	19.3	1.4	
Acceptable Parameter Range:					$\pm 10\%$	$\pm 3\%$	± 0.05	$\pm 10 \text{ mV}$	$\pm 0.2 \text{ }^{\circ}\text{C}$	$\pm 10\%$ turbidity (if using a turbidity meter)
Analytes Sampled for:			Bottles Collected			QA/QC Information	Field Commets			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.				
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic		0.0 ppm background + downhole.				
Approval and Distribution										
Fieldwork Staff Signature		23/8/18	Verifier Name and Signature		13/11/18	Field Commets				
Project Manager Signature		13/11/18	Distribution: Project Central File							

Project Name:	TRC-PFAS SAMPLE	Project Number:	60584690/2.2	PM Name:	JEAN HUGOEN	Bore ID:	GW 22			
Client:	TRC	Project Location:	MOTUNUVI	Fieldwork Staff:	RJ + LARA THART	Sample Date:	21/8/18			
General Bore Information			Parameter Info.		Decontamination	Sampling Method	Hydrasleeve Info.			
Date of GW Level:	21/8/18	Bore Radius (mm):	Chem Kit Serial No.: 0555	<input checked="" type="checkbox"/> Decontaminated	<input checked="" type="checkbox"/> Low Flow Pump rate: 100ml/m	Hydrasleeve Size:	Monitoring sequence followed (number in order):			
Depth to GW (m-pvc):	7.190	Screen Interval (m):	Chem Kit Model:	<input checked="" type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:	Gauging			
Bore Depth (m-pvc):	21.2	Casing Radius (mm):	Corrected Redox: Y / N	<input checked="" type="checkbox"/> Disposable	<input checked="" type="checkbox"/> Bailer	Hydrasleeve	Sampling Depth (m-pvc):			
Depth to Product (m-pvc):		Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	<input checked="" type="checkbox"/> Other (specify)	<input checked="" type="checkbox"/> Peristaltic Pump	Waterna	Hydrasleeve Install time:			
Product Thickness (m):		Bore Locked (YES/NO):	Parameter method: <input checked="" type="checkbox"/> Downhole	<input checked="" type="checkbox"/> Retrieved	<input checked="" type="checkbox"/> Other (specify)		Sampling Start Time:			
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):	Hydrasleeve ou			
Water Quality Parameters										
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	
3:38	0.5	7.190	100ml/m	7.13	150.3	6.87	63.5	15.8	NVO \rightarrow 14 NTU NVO	
3:43	1.0	7.190		6.87	151.9	6.58	82.7	15.8	14 NTU NVO	
3:48	1.5	7.190		6.61	152.0	6.53	88.8	15.6	1.3 NTU NVO	
3:53	2.0	7.190	↓	6.48	152.1	6.90	95.1	15.5	1.4 ↓	
Acceptable Parameter Range:					$\pm 10\%$	$\pm 3\%$	± 0.05	$\pm 10 \text{ mV}$	$\pm 0.2 \text{ }^{\circ}\text{C}$	$\pm 10\%$ turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected			QA/QC Information		Field Commets			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.			
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic			0.0 ppm downhole / background			
Approval and Distribution										
Fieldwork Staff Signature	23/8/18	Checkers Name and Signature	13/11/18	Date						
Project Manager Signature	13/11/18	Distribution: Project Central File								

Project Name:	TRC - PEAD	Project Number:	60584690	PM Name:	SEAN HUGGENS	Bore ID:	CONTROL Ø2		
Client:	TRC / METHANEX	Project Location:	WATKARA VALLEY	Fieldwork Staff:	RJ + LT	Sample Date:	22/08/18		
						Well Development or Well Sampling Event? (circle)			
General Bore Information			Parameter Info.	Decontamination	Sampling Method		Hydrasleeve info.		
Date of GW Level:	22/8/18	Bore Radius (mm):	Chem Kit Serial No.:	<input checked="" type="checkbox"/> Decontaminated	<input type="checkbox"/> Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):		
Depth to GW (m-pvc):	0.999	Screen Interval (m):	Chem Kit Model:	<input checked="" type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:			
Bore Depth (m-pvc):	4.54	Casing Radius (mm):	Corrected Redox: Y / N	<input type="checkbox"/> Disposable	<input type="checkbox"/> Bailer <input checked="" type="checkbox"/> Hydrasleeve	Sampling Depth (m-pvc):	Gauging		
Depth to Product (m-pvc):	—	Cover Type (gated/stick up):	(The correction to apply is probe dependent)	<input type="checkbox"/> Other (specify)	<input checked="" type="checkbox"/> Peristaltic Pump <input checked="" type="checkbox"/> Waterra	Hydrasleeve Install time:	Hydrasleeve in		
Product Thickness (m):	—	Bore Locked (YES/NO):	WINGE	Parameter method: <input type="checkbox"/> Downhole	<input type="checkbox"/> Other (specify)	Sampling Start Time:	Hydrasleeve out		
Calculated bore volume (L):			Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L):				
Water Quality Parameters									
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
10:45	0.5	1.002	100ml/m	2.74	240.0	6.05	54.7	13.8	24.7 NTV NVO →
10:50	1.0	1.002	100ml/m	3.23	240.5	5.87	54.7	13.8	18.3 ↓
10:55	1.5	—	100ml/m	3.25	239.0	5.90	54.2	13.9	17.7 ↓
11:00	2.0	—	100ml/m	3.36	237.3	5.89	54.6	14.0	16.7 ↓
Acceptable Parameter Range: ± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C									± 10% turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected			QA/QC Information		Field Commets		
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)	QAQC Ø5=dup QAQC Ø6=FIELD QAQC Ø7=RINSE		Bore volume calculation, bore condition, fate of tubing, redox correction etc.		
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic					
Approval and Distribution									
Fieldwork Staff Signature	23/8/18	Vicky NT	13/11/18	Project Manager Signature Date					
<i>[Signature]</i>				13/11/18					
Project Manager Signature	Date	Distribution: Project Central File							
<i>[Signature]</i>	13/11/18								

FQM - Groundwater Sampling and Purgging Record

FQM - Groundwater Sampling and Purgung Record

FQM - Groundwater Sampling and Purging Record

FAIR AMOUNT
OF OXIDIZED Fe
in well +
sample

Project Name:	TRC PFAS	Project Number:	60584690	PM Name:	JEAN HUGGENS	Bore ID:	GW10								
Client:	TRC/McMANEY	Project Location:	WATARRA VALLEY	Fieldwork Staff:	RJ FCT	Sample Date:	22/8/18								
General Bore Information			Parameter Info.	Decontamination	Sampling Method	Hydrasleeve info.									
Date of GW Level:	22/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	0555	<input type="checkbox"/> Decontaminated	<input checked="" type="checkbox"/> Low Flow Pump rate: 100ml/m	Hydrasleeve Size:	Monitoring sequence followed (number in order):						
Depth to GW (m-pvc):	1.512	Screen Interval (m):	—	Chem Kit Model:	—	<input type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:	—						
Bore Depth (m-pvc):	4.85	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	<input type="checkbox"/> Bailer	<input type="checkbox"/> Hydrasleeve	Sampling Depth (m-pvc):	Gauging					
Depth to Product (m-pvc):	—	Cover Type (garter/stick up):	ring	(The correction to apply is probe dependent)	—	<input type="checkbox"/> Other (specify)	<input checked="" type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Waterra	Hydrasleeve Install time:	Hydrasleeve in					
Product Thickness (m):	—	Bore Locked (YES/NO):	—	Parameter method:	<input checked="" type="checkbox"/> Downhole	<input type="checkbox"/> Retrieved	<input type="checkbox"/> Other (specify)	—	Sampling Start Time:	Hydrasleeve out					
Calculated bore volume (L): —		Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):									
Water Quality Parameters															
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity						
2:30	0.5	1.512	100ml/m	6.36	112.9	6.74	42.7	16.1	NVO \rightarrow NTU \rightarrow 35.6 7 slug of something						
2:35	1.0	1.512	100ml/m	5.79	113.4	6.09	42.1	16.0	NTU \rightarrow 7.7						
2:40	1.5	1.512	100ml/m	5.75	112.9	6.04	44.0	16.0	6.8						
2:45	2.0	1.512	100ml/m	5.68	112.8	6.04	45.2	16.1	5.4						
Acceptable Parameter Range:										$\pm 10\%$	$\pm 3\%$	± 0.05	$\pm 10\text{ mV}$	$\pm 0.2\text{ }^{\circ}\text{C}$	$\pm 10\%$ turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information			Field Commets						
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.									
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic		0.0PPM - B.G									
						0.1ppm - downhole									
						MeOH = 7.5 O ₂ = 2.9 H ₂ S = 0 CO = 0 CH ₄ = 0									
Approval and Distribution															
Fieldwork Staff Signature		22/8/18		Vicki NT		13/11/18									
Project Manager Signature		13/11/18		Distribution: Project Central File											

FQM - Groundwater Sampling and Purgung Record

Project Name:	TRL PFAS	Project Number:	60584690	PM Name:	SEAN HEDGENS	Bore ID:	GWS				
Client:	TRL IMERITEX	Project Location:	WATKINS VALLEY	Fieldwork Staff:	RJ RL7	Sample Date:	22/8/18				
General Bore Information			Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.					
Date of GW Level:	22/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	0555	<input type="checkbox"/> Decontaminated	Low Flow Pump rate: 100ml/min	Hydrasleeve Size:	Monitoring sequence followed (number in order):		
Depth to GW (m-pvc):	1.447	Screen Interval (m):	—	Chem Kit Model:	—	<input type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:	—		
Bore Depth (m-pvc):	3.38	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	—	Sampling Depth (m-pvc):	Gauging		
Depth to Product (m-pvc):	—	Cover Type (caticlic/stick up):	—	(The correction to apply is probe dependent)	—	<input type="checkbox"/> Bailer	<input type="checkbox"/> Hydrasleeve	Hydrasleeve Install time:	Hydrasleeve in		
Product Thickness (m):	—	Bore Locked (YES/NO):	bunge	Parameter method:	<input type="checkbox"/> Downhole	<input type="checkbox"/> Other (specify)	<input type="checkbox"/> Peristaltic Pump	Waterra	Hydrasleeve Start Time:	Hydrasleeve out	
Calculated bore volume (L):	—	Key Type (if applicable):	—		<input type="checkbox"/> Retrieved		<input type="checkbox"/> Other (specify)		Sampling Start Time:	Hydrasleeve out	
Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):		Parameters					
Water Quality Parameters											
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity		
15:20	0.5	1.447	100ml/min	2.96	115.5	6.28	65.8	17.8	10.0 NTU	NVO - slight turbidity	
15:25	1.0	1.447	—	2.65	167.0	6.02	69.3	17.9	9.0	“	
15:30	1.5	1.447	—	2.67	179.0	6.06	69.3	17.9	6.2	“	
15:35	2.0	1.447	100ml/min	2.62	185.8	6.06	69.0	17.9	6.1	“	
Acceptable Parameter Range: $\pm 10\%$ $\pm 3\%$ ± 0.05 $\pm 10\text{ mV}$ $\pm 0.2\text{ °C}$										$\pm 10\%$ turbidity (if using a turbidity meter)	
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Comments			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.				
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic			0.0 ppm downhole + background.				
Approval and Distribution											
Fieldwork Staff Signature	22/8/18	Verifier Name	13/11/18	Date							
Project Manager Signature	13/11/18	Distribution: Project Central File		Date							

FQM - Groundwater Sampling and Purgung Record

Project Name:	TRL - PFAJ	Project Number:	60584690	PM Name:	SEAN HUGGENS	Bore ID:	GW 8A			
Client:	TRL / METHANE	Project Location:	WAITARA VALLEY	Fieldwork Staff:	RJ + LT	Sample Date:	22/8/18			
General Bore Information				Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.			
Date of GW Level:	22/8/18	Bore Radius (mm):	150	Chem Kit Serial No.:	055 5	<input checked="" type="checkbox"/> Decontaminated	<input checked="" type="checkbox"/> Low Flow Pump rate: 100ml/m	Hydrasleeve Size:	Monitoring	
Depth to GW (m-pvc):	3.064	Screen Interval (m):	—	Chem Kit Model:	—	<input checked="" type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:	sequence followed (number in order):	
Bore Depth (m-pvc):	5.40	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	<input type="checkbox"/> Bailer	<input type="checkbox"/> Hydrasleeve	Gauging	
Depth to Product (m-pvc):	—	Cover Type (gated/stick up):	—	(The correction to apply is probe dependent)	—	<input type="checkbox"/> Other (specify)	<input checked="" type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Waterra	Hydrasleeve in	
Product Thickness (m):	—	Bore Locked (YES/NO):	hinge	Parameter method:	<input type="checkbox"/> Downhole	<input type="checkbox"/> Retrieved	<input type="checkbox"/> Other (specify)	Hydrasleeve Install time:	Hydrasleeve out	
Calculated bore volume (L):	—	Key Type (if applicable):	top						Parameters	
Includes/ excludes bore annulus (circle)		# purge volumes removed:			Total purged volume (L):					
Water Quality Parameters										
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	
16:00	0.5	3.064	100ml/m	7.06	115.6	7.10	64.2	17.7	7.3 NTU NVO	
16:05	1.0	3.097	—	6.95	115.7	6.39	62.9	18.0	6.64 " "	
16:10	1.5	—	—	6.94	116.0	6.20	62.6	18.2	7.00 " "	
16:15	2.0	—	—	6.93	116.0	6.16	63.3	18.3	7.5 " "	
16:20	2.5	—	—	6.92	116.3	6.14	63.8	18.3	7.2 " "	
Acceptable Parameter Range:					± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)
Analytes Sampled for:			Bottles Collected			QA/QC Information		Field Commets		
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.			
		x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic			BACKGROUND → 0.0 ppm			
							DOWNHOLE → " "			
							0.1 ppm			
Approval and Distribution										
Fieldwork Staff Signature		23/8/18	Checker Name and Signature		13/11/18					
		—			—					
Project Manager Signature		Date	Distribution: Project Central File		Date					
		13/11/18								

FQM - Groundwater Sampling and Purgung Record

Project Name:	TRL-PFAJ	Project Number:	60584690	PM Name:	SEAN HUGGENS	Bore ID:	6W9B			
Client:	TRL/METHANEX	Project Location:	PORT TARANAKI	Fieldwork Staff:	RJ + LT	Sample Date:	23/8/18			
General Bore Information				Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.			
Date of GW Level:	23/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	055 5	<input checked="" type="checkbox"/> Decontaminated	<input checked="" type="checkbox"/> Low Flow Pump rate: 100m ³ /m	Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):	1.679	Screen Interval (m):	—	Chem Kit Model:	—	<input checked="" type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:	—	
Bore Depth (m-pvc):	5.83	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	<input type="checkbox"/> Bailer	Sampling Depth (m-pvc):	Gauging	
Depth to Product (m-pvc):	—	Cover Type (stick up):	(The correction to apply is probe dependent)	Parameter method:	<input checked="" type="checkbox"/> Downhole	<input type="checkbox"/> Other (specify):	<input checked="" type="checkbox"/> Hydrasleeve	Hydrasleeve Install time:	Hydrasleeve in	
Product Thickness (m):	—	Bore Locked (YES/NO):	—		<input type="checkbox"/> Retrieved		<input checked="" type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Waterra	Hydrasleeve out	
Calculated bore volume (L):	—	Key Type (if applicable):	N/A				<input type="checkbox"/> Other (specify):	Sampling Start Time:	Parameters	
Includes/ excludes bore annulus (circle)				# purge volumes removed:	Total purged volume (L):					
Water Quality Parameters										
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	
8:48	0.5	1.683	100m ³ /m	1.84	634	6.80	103.2	15.4	1.5 NTU	→ NVO - clear
8:53	1.0	1.683	100m ³ /m	1.45	645	6.73	73.2	16.0	1.4 NTU	—
8:58	1.5	↓	↓	1.37	643	6.72	64.5	16.1	1.4 NTU	—
9:03	2.0	↓	↓	1.34	642	6.72	57.9	16.1	1.5 NTU	—
Acceptable Parameter Range:										± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C ± 10% turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Commets		
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)	QAQLO8 - DUP		Bore volume calculation, bore condition, fate of tubing, redox correction etc.			
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic	QAQLO9 - FIELD		Needs manhole lifter to access			
					QAQL10 - RINGATE		had to bail out water w bucket			
							and bail out water below well cap w plastic bag.			
Approval and Distribution										0.0 ppm both B6 + downzone
Fieldwork Staff Signature		23/8/18	Vicky N		13/11/18	Date		Date		
Project Manager Signature		13/11/18	Distribution: Project Central File							

GW9A not available to sample as area of
bund was underwater following overnight
rain

Project Name:	TRL - PFAS	Project Number:	60584690	PM Name:	SEAN HEDGENS	Bore ID:	GW9AA			
Client:	TRL - METHANEX	Project Location:	BORT TARANAKI	Fieldwork Staff:	RJ & LT	Sample Date:	23/08/18			
General Bore Information				Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.			
Date of GW Level:	23/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	DSS 5	<input type="checkbox"/> Decontaminated	Low Flow Pump rate: 100ml/m	Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):	2.221	Screen Interval (m):	—	Chem Kit Model:	—	<input type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:		
Bore Depth (m-pvc):	4.90	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	Bailer	Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	—	Cover Type (gatlic/stick up):	(The correction to apply is probe dependent)	Parameter method:	<input checked="" type="checkbox"/> Downhole	<input type="checkbox"/> Other (specify)	Peristaltic Pump	Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	—	Bore Locked (YES/NO):	—		<input type="checkbox"/> Retrieved	<input type="checkbox"/> Other (specify)			Sampling Start Time:	Hydrasleeve out
Calculated bore volume (L):	—	Includes/ excludes bore annulus (circle):	—	# purge volumes removed:	—	Total purged volume (L):	—		Parameters	
Water Quality Parameters										
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity	
10:30	0.5	2.221	100ml/m	2.32	967	6.50	-4.5	15.7	3.2 NTU	- organic odour
10:35	1.0			1.29	988	6.53	-29.6	15.6	2.3 "	- no sheen visible
10:40	1.5			1.18	996	6.54	-37.3	15.7	3.0 "	
10:45	2.0			1.13	1004	6.55	-42.7	15.8	2.2 "	
Acceptable Parameter Range: ± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C ± 10% turbidity (if using a turbidity meter)										
Analytes Sampled for:		Bottles Collected			QA/QC Information		Field Commets			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.			
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic			NEED MANHOLE LIFTER.			
							→ well lid/cap under water + needed bailing out.			
							→ sheen visible on water under well lid - above sealed cap.			
Approval and Distribution										
Fieldwork Staff Signature		23/8/18	Vetby, NZ		Checker Name and Signature		13/11/18		Date	
Project Manager Signature		13/11/18								
Distribution: Project Central File										

→ organic (marine) odour in water

FQM - Groundwater Sampling and Purgung Record

Project Name:	TRC - PFAS	Project Number:	60584690	PM Name:	SEAN HUGGENS	Bore ID:	GW0M1	→ = GW27			
Client:	TRC /METHANE	Project Location:	OMATAI TANKFARM	Fieldwork Staff:	RJ + LT	Sample Date:	23/8/18				
General Bore Information						Well Development or Well Sampling Event? (circle)					
Date of GW Level:	23/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	0555	Decontamination	Sampling Method	Hydrasleeve info.			
Depth to GW (m-pvc):	1.838	Screen Interval (m):	—	Chem Kit Model:		<input type="checkbox"/> Decontaminated	<input checked="" type="checkbox"/> Low Flow Pump rate: 100ml/m	Hydrasleeve Size: <input checked="" type="checkbox"/>			
Bore Depth (m-pvc):	6.0	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Dedicated	Intake depth: <input checked="" type="checkbox"/>	Hydrasleeve Type: <input checked="" type="checkbox"/>			
Depth to Product (m-pvc):	—	Cover Type (gatic/stick up):		(The correction to apply is probe dependent)		<input type="checkbox"/> Disposable	<input type="checkbox"/> Bailer	Sampling Depth (m-pvc): <input checked="" type="checkbox"/>			
Product Thickness (m):	—	Bore Locked (YES/NO):		Parameter method:	<input checked="" type="checkbox"/> Downhole	<input type="checkbox"/> Other (specify): <input checked="" type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Hydrasleeve	Gauging			
Calculated bore volume (L): —		Includes/ excludes bore annulus (circle)		# purge volumes removed:		<input type="checkbox"/> Retrieved	<input checked="" type="checkbox"/> Waterra	Hydrasleeve Install time: <input checked="" type="checkbox"/>			
Water Quality Parameters											
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity		
11:35	0.5	1.836	100ml/m	8.85	135.7	7.40	5.2	17.6	6.2 NTU NVO		
11:40	1.0	1.836	↓	8.88	135.4	6.85	5.3	17.5	5.6		
11:45	1.5	↓	↓	8.92	134.8	6.71	7.0	17.4	70-100- fluctuating		
11:50	2.0	↓	↓	8.95	134.6	6.69	8.4	17.4	1.4 NTU ↓		
Acceptable Parameter Range:						± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Commets			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.					
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic		0.3 ppm → background					
						0.0 ppm → downhole					
						ppm					
Approval and Distribution											
Fieldwork Staff Signature		23/8/18	Vicky N		13/11/18						
Project Manager Signature		13/11/18	Distribution: Project Central File								

FQM - Groundwater Sampling and Purging Record

Project Name:	TRL-PFAS	Project Number:	60584690	PM Name:	SEAN HUGGENS	Bore ID:	GW28				
Client:	TRL/METHANEX	Project Location:	OMATA 2 TANK FARM	Fieldwork Staff:	RJ + LT	Sample Date:	23/8/18				
General Bore Information				Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.				
Date of GW Level:	23/8/18	Bore Radius (mm):	250	Chem Kit Serial No.:	0555	<input type="checkbox"/> Decontaminated	Low Flow Pump rate: 100ml/min	Hydrasleeve Size:	Monitoring sequence followed (number in order):		
Depth to GW (m-pvc):	5.638	Screen Interval (m):	—	Chem Kit Model:	—	<input type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:			
Bore Depth (m-pvc):	12.0	Casing Radius (mm):	50	Corrected Redox:	Y / N	<input type="checkbox"/> Disposable	Bailer	Hydrasleeve		Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	—	Cover Type (gatic/stick up):	—	(The correction to apply is probe dependent)		<input type="checkbox"/> Other (specify)	Peristaltic Pump	Waterra		Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	—	Bore Locked (YES/NO):	—	Parameter method:	<input checked="" type="checkbox"/> Downhole	<input type="checkbox"/> Retrieved	<input type="checkbox"/> Other (specify)		Sampling Start Time:	Hydrasleeve out	
Calculated bore volume (L):		Includes/ excludes bore annulus (circle)		# purge volumes removed:		Total purged volume (L):				Parameters	
Water Quality Parameters											
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity		
12:15	0.5	5.638	100ml/min	1.57	402.2	6.51	2.6	16.2	2.2 NTU	→ NVO	
12:20	1.0	5.679	—	1.04	406.1	6.46	-13.7	16.4	3.6	“	
12:25	1.5	—	—	0.99	405.7	6.46	-16.3	16.4	3.7	“	
12:30	2.0	—	—	0.87	405.2	6.47	-20.1	16.5	4.6	“	
Acceptable Parameter Range: ± 10% ± 3% ± 0.05 ± 10 mV ± 0.2 °C ± 10% turbidity (if using a turbidity meter)											
Analytes Sampled for:		Bottles Collected			QA/QC Information			Field Comments			
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.					
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic		0.0 ppm - Background					
						0.0 ppm - down hole.					
Approval and Distribution											
Fieldwork Staff Signature		23/8/18	Verifier Name			13/11/18	Field Commets				
											
Fieldwork Staff Signature		Date	Checker Name and Signature			Date					
		13/11/18									
Project Manager Signature		Date	Distribution: Project Central File								
											

FQM - Groundwater Sampling and Purging Record

Project Name:	TRL-PFAJ SAMPLING	Project Number:	60584690	PM Name:	SEAN HUGGENS	Bore ID:	GW29		
Client:	TRL/METHANEX	Project Location:	OMATA 2 TANK FARM	Fieldwork Staff:	RJ + LT (memorandum)	Sample Date:	23/8/18		
General Bore Information			Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.			
Date of GW Level:	23/8/18	Bore Radius (mm):	250	Chem Kit Serial No.: VS10555	<input checked="" type="checkbox"/> Decontaminated	<input checked="" type="checkbox"/> Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):	
Depth to GW (m-pvc):	9.018	Screen Interval (m):	—	Chem Kit Model:	<input checked="" type="checkbox"/> Dedicated	Intake depth:	Hydrasleeve Type:	Gauging	
Bore Depth (m-pvc):	15.0	Casing Radius (mm):	50	Corrected Redox: Y/N	<input checked="" type="checkbox"/> Disposable	<input checked="" type="checkbox"/> Bailer	Hydrasleeve	Sampling Depth (m-pvc):	
Depth to Product (m-pvc):	—	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	<input checked="" type="checkbox"/> Other (specify):	<input checked="" type="checkbox"/> Downhole	<input checked="" type="checkbox"/> Peristaltic Pump	Waterra	Hydrasleeve Install time:	
Product Thickness (m):	—	Bore Locked (YES/NO):	Parameter method:	<input checked="" type="checkbox"/> Retrieved	<input checked="" type="checkbox"/> Other (specify):	<input checked="" type="checkbox"/> Other (specify):	Sampling Start Time:	Hydrasleeve ou	
Calculated bore volume (L):	—	Key Type (if applicable): N/A	# purge volumes removed:	Total purged volume (L):				Parameters	
Water Quality Parameters									
Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or μ S/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
13:10	—	9.018	—	7.37	130.0	6.32	27.1	18.7	NVO
Acceptable Parameter Range: $\pm 10\%$ $\pm 3\%$ ± 0.05 ± 10 mV ± 0.2 °C									$\pm 10\%$ turbidity (if using a turbidity meter)
Analytes Sampled for:		Bottles Collected				QA/QC Information		Field Commets	
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO ₃)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.		
		x 40 mL Vial (H ₂ SO ₄)	x 100 mL Amber	x 250 mL Plastic			0.0 ppm Background downhole.		
Approval and Distribution									
Fieldwork Staff Signature		23/8/18	Vicky W		13/11/18				
Project Manager Signature		13/11/18	Checker Name and Signature		Date				
Distribution: Project Central File									

Appendix B

Laboratory Analytical Reports

Certificate of Analysis

Final Report

Sean Hudgens
AECOM Consulting Services - Wellington
PO Box 27277
Wellington 6141
New Zealand

PO Number: 73494

Submitted by:
Taranaki Regional Council
Private Bag 713
Stratford 4352
New Zealand

Report Issued: 18-Sep-2018

AsureQuality Reference: 18-213689

Sample(s) Received: 23-Aug-2018 07:30

Results

The tests were performed on the samples as received.

Customer Sample Name: GW21

AsureQuality ID: 18-213689-1

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PPPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.014	µg/L	AsureQuality Method (LC-MS/MS)
PPPeA	0.035	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.029	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.035	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.017	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0058	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.0015	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	0.0012	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	121	%	AsureQuality Method (LC-MS/MS)
M4PFBA	63	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	88	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	89	%	AsureQuality Method (LC-MS/MS)
M8PFOA	89	%	AsureQuality Method (LC-MS/MS)
M9PFNA	94	%	AsureQuality Method (LC-MS/MS)
M6PFDA	116	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	199 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	81	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	148	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	133	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	133	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	92	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	77	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: GW22

AsureQuality ID: 18-213689-2

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0069	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0019	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0023	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0029	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0012	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	93	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	94	%	AsureQuality Method (LC-MS/MS)
M8PFOS	120	%	AsureQuality Method (LC-MS/MS)
M4PFBA	65	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	89	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	90	%	AsureQuality Method (LC-MS/MS)
MPFHxA	92	%	AsureQuality Method (LC-MS/MS)
M8PFOA	95	%	AsureQuality Method (LC-MS/MS)
M9PFNA	93	%	AsureQuality Method (LC-MS/MS)
M6PFDA	127	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M7PFUnDA	201 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	152 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	133	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	214 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	151 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	182 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	79	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	115	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: GW31 AsureQuality ID: 18-213689-3

Sample Description: Groundwater

Sample Condition: Acceptable Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.52	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.30	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.18	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.094	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.030	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	0.0045	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluoroctanesulfonamides			
PFOSA	NR	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	0.0043	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	1.1	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	0.18	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	72	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	76	%	AsureQuality Method (LC-MS/MS)
M8PFOS	94	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	81	%	AsureQuality Method (LC-MS/MS)
M9PFNA	89	%	AsureQuality Method (LC-MS/MS)
M6PFDA	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	210 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	117	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	79	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	150	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	110	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: GW33	AsureQuality ID: 18-213689-4
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Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	0.35	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.34	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	0.36	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.67	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	0.091	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	0.24	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	0.64	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	110	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	103	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	121	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	110	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	102	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFDoDA *	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	135	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	111	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	106	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	116	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	104	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: GW37

AsureQuality ID: 18-213689-5

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.0029	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0038	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0016	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	92	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	116	%	AsureQuality Method (LC-MS/MS)
M4PFBA	89	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	93	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	91	%	AsureQuality Method (LC-MS/MS)
MPFHpA	92	%	AsureQuality Method (LC-MS/MS)
M8PFOA	94	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	115	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	158 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDaDA	185 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	132	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	123	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	72	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	81	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	75	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: Control01 AsureQuality ID: 18-213689-6

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	98	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	92	%	AsureQuality Method (LC-MS/MS)
M8PFOS	77	%	AsureQuality Method (LC-MS/MS)
M4PFBA	90	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	99	%	AsureQuality Method (LC-MS/MS)
MPFHpA	94	%	AsureQuality Method (LC-MS/MS)
M8PFOA	91	%	AsureQuality Method (LC-MS/MS)
M9PFNA	86	%	AsureQuality Method (LC-MS/MS)
M6PFDA	80	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	71	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	68	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	59	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	56	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	NR	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	75	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	83	%	AsureQuality Method (LC-MS/MS)

QC Results

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Relates to sample(s) 18-213689-1, 18-213689-2, 18-213689-3, 18-213689-5, 18-213689-6

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	89	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	92	%	AsureQuality Method (LC-MS/MS)
M8PFOS	90	%	AsureQuality Method (LC-MS/MS)
M4PFBA	88	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	87	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	89	%	AsureQuality Method (LC-MS/MS)
M8PFOA	89	%	AsureQuality Method (LC-MS/MS)
M9PFNA	86	%	AsureQuality Method (LC-MS/MS)
M6PFDA	92	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	138	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	285 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	130	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	235 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	150	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	84	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	73	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

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Relates to sample(s) 18-213689-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
L-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	107	%	AsureQuality Method (LC-MS/MS)
M4PFBA	104	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA	108	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M6PFDA	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	111	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	51	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)

Blank

Relates to sample(s) 18-213689-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<1.0	µg/L	AsureQuality Method (LC-MS/MS)

Perfluoroctanesulfonamides

PFOSA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Perfluoroctanesulfonamidoacetic acids

NEtFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Perfluoroctanesulfonamidoethanols

NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Telomere Sulfonic acids

4:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Internal Standards

M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	110	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	104	%	AsureQuality Method (LC-MS/MS)
MPFHpA	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	114	%	AsureQuality Method (LC-MS/MS)
M6PFDA	110	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	100	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	39	%	AsureQuality Method (LC-MS/MS)
MPFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	102	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	103	%	AsureQuality Method (LC-MS/MS)

Analysis Summary**Wellington Laboratory**

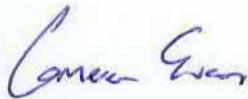
Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Cameron Evans

Analysis	Method	Accreditation	Authorised by
di-PFHxS (1)	= Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)		
mono-PFHxS (1)	= Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)		
L-PFHxS (1)	= Concentration determined using the linear PFHxS isomer standard (399>80 transition)		
Total PFHxS (3)	= The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)		
di-PFOS (5)	= Concentration determined using a branched di-PFOS isomer standard (499>80 transition)		
mono-PFOS (5)	= Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)		
L-PFOS (5)	= Concentration determined using the linear PFOS isomer standard (499>230 transition)		
Total PFOS (7)	= The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)		
Sum PFHxS+PFOS (1)	= The numerical sum of Total PFHxS (3) and Total PFOS (7)		
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.			
Reported results are corrected for internal standard recovery			

Any tests marked with * are not accredited for specific matrices or analytes.

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable



Cameron Evans

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte LOR (µg/L)

Listing applies to samples: 18-213689-4

Perfluoroalkylsulfonic acids

PFPrS*	0.0010
PFBS*	0.0010
PPPeS*	0.0010
di-PFHxS (1)*	0.0010
mono-PFHxS (1)*	0.0010
L-PFHxS (1)*	0.0010
Total PFHxS (3)*	0.0010
PFHpS*	0.0010
di-PFOS (5)*	0.0010
mono-PFOS (5)*	0.0010
L-PFOS (5)*	0.0010
Total PFOS (7)*	0.0010
Sum PFHxS+PFOS (1)*	0.0010
PFNS*	0.0010
PFDS*	0.0010

Perfluoroalkylcarboxylic acids

PFBA*	0.0010
PPPeA*	0.0010
PFHxA*	0.0010
PFHpA*	0.0010
PFOA*	0.0010
PFNA*	0.0010
PFDA*	0.0010
PFUnDA*	0.0010
PFDoDA*	0.0010
PFTrDA*	0.0010
PFTeDA*	0.0010

Perfluoroctanesulfonamides

PFOSA*	0.0010
NEtFOSA-M*	0.0010
NMeFOSA-M*	0.0010

Perfluoroctanesulfonamidoacetic acids

NEtFOSAA*	0.0010
NMeFOSAA*	0.0010

Perfluoroctanesulfonamidoethanols

NEtFOSE-M*	0.0010
NMeFOSE-M*	0.0010

Telomere Sulfonic acids

4:2 FTS*	0.0010
6:2 FTS*	0.0010
8:2 FTS*	0.0010

Listing applies to samples: 18-213689-1, 18-213689-2, 18-213689-3, 18-213689-5, 18-213689-6

PFPrS	0.0010
PFBS	0.0010
PPPeS	0.0010

di-PFHxS (1)	0.0010
mono-PFHxS (1)	0.0010
L-PFHxS (1)	0.0010
Total PFHxS (3)	0.0010
PFHpS	0.0010
di-PFOS (5)	0.0010
mono-PFOS (5)	0.0010
L-PFOS (5)	0.0010
Total PFOS (7)	0.0010
Sum PFHxS+PFOS (1)	0.0010
PFNS	0.0010
PFDS	0.0010
Perfluoroalkylcarboxylic acids	
PFBA	0.0010
PPPeA	0.0010
PFHxA	0.0010
PFHpA	0.0010
PFOA	0.0010
PFNA	0.0010
PFDA	0.0010
PFUnDA	0.0010
PFDoDA	NR
PFTrDA	NR
PFTeDA	NR
Perfluoroctanesulfonamides	
PFOSA	NR
NEtFOSA-M	NR
NMeFOSA-M	NR
Perfluoroctanesulfonamidoacetic acids	
NEtFOSAA	0.0010
NMeFOSAA	0.0010
Perfluoroctanesulfonamidoethanols	
NEtFOSE-M	NR
NMeFOSE-M	NR
Telomere Sulfonic acids	
4:2 FTS	0.0010
6:2 FTS	0.0010
8:2 FTS	0.0010

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte Full Name

Listing applies to samples: 18-213689-4

Perfluoroalkylsulfonic acids

PFPrS*	Perfluoro-1-propanesulfonic acid
PFBS*	Perfluoro-1-butanesulfonic acid
PPPeS*	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)*	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)*	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)*	Linear Perfluorohexanesulfonic acid
PFHpS*	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)*	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)*	Total Perfluoromethylheptane sulfonic acids

Analyte	Full Name
L-PFOS (5)*	Linear Perfluorooctanesulfonic acid
PFNS*	Perfluoro-1-nonanesulfonic acid
PFDS*	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA*	Perfluoro-n-butanoic acid
PPPeA*	Perfluoro-n-pentanoic acid
PFHxA*	Perfluoro-n-hexanoic acid
PFHpA*	Perfluoro-n-heptanoic acid
PFOA*	Perfluoro-n-octanoic acid
PFNA*	Perfluoro-n-nonanoic acid
PFDA*	Perfluoro-n-decanoic acid
PFUnDA*	Perfluoro-n-undecanoic acid
PFDoDA*	Perfluoro-n-dodecanoic acid
PFTrDA*	Perfluoro-n-tridecanoic acid
PFTeDA*	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA*	Perfluoro-1-octanesulfonamide
NEtFOSA-M*	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M*	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA*	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA*	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M*	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS*	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS*	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS*	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS*	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS*	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS*	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA*	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PPPeA*	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA*	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA*	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA*	Perfluoro-n-[13C8]octanoic acid
M9PFNA*	Perfluoro-n-[13C9]nonanoic acid
M6PFDA*	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA*	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA*	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA*	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA*	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA*	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA*	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA*	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA*	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE*	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE*	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Analyte**Full Name**

Listing applies to samples: 18-213689-1, 18-213689-2, 18-213689-3, 18-213689-5, 18-213689-6

Perfluoroalkylsulfonic acids

PFPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

PFBA	Perfluoro-n-butanoic acid
PPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDoDA	Perfluoro-n-dodecanoic acid
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid

Perfluorooctanesulfonamides

PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluorooctanesulfonamidoethanols

NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable



Food and Environmental Submission Form/Chain of Custody

Customer Details

Company Name: * Taranaki Regional Council
 Contact Person: * Callum Mackenzie
 Email: * callum.mackenzie@trc.govt.nz
 Contact Phone No.: * 06 765 7127
 Address:

Submission Ref.:

Purchase Order No.: 73494

Contract/Quote No.:

Reporting Details

Report Results To: * sean.hudgens@aecom.com

Extra Copies To:

Report each sample separately? *

If multiple samples are listed below, tick yes
 to receive an individual CoA for each sample.

Yes

No

Sample Sent By (Name): * Rebecca Joyce Signed By: *

Date/Time Dispatched:

Condition sample(s) dispatched in: Ambient Chilled Frozen

Quarantine (Include a copy of the MPI Import Permit/Transfer Form stating country of origin)

Return sample(s) after analysis (Courier fees apply)

NOTE: Samples will be discarded/returned 8 weeks after reporting unless otherwise instructed.

AQ to composite samples? Yes

Are samples hazardous to health? * Yes No

Water samples submitted? * Potable Non-Potable

Submission Label

18-212532

AsureQuality Limited

Wellington Laboratory
 1C Quadrant Drive, Waiwhetu
 Lower Hutt 5010

New Zealand

Tel: +64 4 570 8359

Email: GracefieldSR@asurequality.com

Urgency Details*

Normal Turn-around-time (TAT)

Urgent Service (please select from options below)

Half quoted TAT (50% surcharge)

Quarter quoted TAT (100% surcharge)

NOTE: For urgent testing, please contact AQ prior to
 submitting samples to confirm availability.

Sample Name* (unique sample identifier)	Sample Type* (Type of product/substance/material E.g., Potable Water, Soil, Biota Product, Apple, Cow Liver, Apple, Honey, Spleenach)	Sample Description (additional sample information, to appear on report)	Sampled Date (used to determine holding time, if applicable)	Testing Requirements* (test or compounds to be tested for)	AQ Ref. only
GW21	Groundwater	Groundwater	21/08/18	DX - PFCS01	
GW22					
GW31					
GW33					
GW37					
Control Ø1					
Ø2					
Ø3					

*Required information

Comments/Additional Information:

Received By (Name): * Lauren Mockeff

Signed By: *

7:30
23/08/18

12 C

NZ Couriers



LB 09801069

Certificate of Analysis

Final Report

Sean Hudgens
AECOM Consulting Services - Wellington
PO Box 27277
Wellington 6141
New Zealand

PO Number: 73494

Submitted by:
Taranaki Regional Council
Private Bag 713
Stratford 4352
New Zealand

Report Issued: 13-Sep-2018

AsureQuality Reference: **18-213406**

Sample(s) Received: 23-Aug-2018 07:30

Results

The tests were performed on the samples as received.

Customer Sample Name: GW3

AsureQuality ID: 18-213406-1

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.46	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.29	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.046	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.051	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	98	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	117	%	AsureQuality Method (LC-MS/MS)
M4PFBA	NR	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	85	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	87	%	AsureQuality Method (LC-MS/MS)
MPFHpA	98	%	AsureQuality Method (LC-MS/MS)
M8PFOA	49	%	AsureQuality Method (LC-MS/MS)
M9PFNA	99	%	AsureQuality Method (LC-MS/MS)
M6PFDA	124	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	181 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	218 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	86	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	125	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	129	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	45	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	63	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	86	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	104	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: GW5	AsureQuality ID: 18-213406-2
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Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.056	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	106	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	105	%	AsureQuality Method (LC-MS/MS)
MPFHxA *	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	115	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	112	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M7PFUnDA *	110	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	102	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	106	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	111	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	111	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	112	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	103	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: GW8A

AsureQuality ID: 18-213406-3

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0012	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0086	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.020	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.012	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0040	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS	124	%	AsureQuality Method (LC-MS/MS)
M4PFBA	44	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA	112	%	AsureQuality Method (LC-MS/MS)
M8PFOA	74	%	AsureQuality Method (LC-MS/MS)
M9PFNA	106	%	AsureQuality Method (LC-MS/MS)
M6PFDA	123	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	188 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	158 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	140	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	121	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	122	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	140	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	129	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: GW10

AsureQuality ID: 18-213406-4

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFhS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFhS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFhS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.055	µg/L	AsureQuality Method (LC-MS/MS)
PPPeA	0.21	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.048	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0081	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.028	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	108	%	AsureQuality Method (LC-MS/MS)
M8PFOS	121	%	AsureQuality Method (LC-MS/MS)
M4PFBA	48	%	AsureQuality Method (LC-MS/MS)
M5PPeA	97	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	112	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	66	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	120	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	112	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	124	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFOSA	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	78	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	126	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	136	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	89	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	126	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	95	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	114	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: GW46

AsureQuality ID: 18-213406-5

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	0.24	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.14	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	101	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	103	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	112	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	111	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	101	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	119	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	105	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	108	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	101	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: GW47

AsureQuality ID: 18-213406-6

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	106	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	110	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	110	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	102	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	105	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	85	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	108	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNMeFOSA *	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	102	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	98	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Control02

AsureQuality ID: 18-213406-7

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	110	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	116	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	119	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	114	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	111	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	116	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	147	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	113	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	109	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	116	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	101	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Duplicate of 18-213406-1

AsureQuality ID: 18-213406-8

Sample Description: GW3 dup

Sample Condition: Acceptable

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.46	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.28	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.045	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.050	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	83	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	88	%	AsureQuality Method (LC-MS/MS)
M8PFOS	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA	NR	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	72	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	74	%	AsureQuality Method (LC-MS/MS)
MPFHpA	84	%	AsureQuality Method (LC-MS/MS)
M8PFOA	42	%	AsureQuality Method (LC-MS/MS)
M9PFNA	82	%	AsureQuality Method (LC-MS/MS)
M6PFDA	123	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	205 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	162 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	139	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	236 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	153 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	80	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	69	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	97	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

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Relates to sample(s) 18-213406-1, 18-213406-3, 18-213406-8

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	89	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	92	%	AsureQuality Method (LC-MS/MS)
M8PFOS	90	%	AsureQuality Method (LC-MS/MS)
M4PFBA	88	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	87	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	89	%	AsureQuality Method (LC-MS/MS)
MPFHpA	89	%	AsureQuality Method (LC-MS/MS)
M8PFOA	89	%	AsureQuality Method (LC-MS/MS)
M9PFNA	86	%	AsureQuality Method (LC-MS/MS)
M6PFDA	92	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	138	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	285 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	NR	%	AsureQuality Method (LC-MS/MS)
MPFOSA	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	NR	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	130	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	235 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	150	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	84	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	73	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

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Relates to sample(s) 18-213406-2, 18-213406-5, 18-213406-6, 18-213406-7

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
di-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	107	%	AsureQuality Method (LC-MS/MS)
M4PFBA	104	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHxA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA	108	%	AsureQuality Method (LC-MS/MS)
M6PFDA	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	111	%	AsureQuality Method (LC-MS/MS)
MPFDsDA	104	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFTeDA	51	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)

Blank

Relates to sample(s) 18-213406-2, 18-213406-5, 18-213406-6, 18-213406-7

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PPeS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	110	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	104	%	AsureQuality Method (LC-MS/MS)
MPFHxA	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	114	%	AsureQuality Method (LC-MS/MS)
M6PFDA	110	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	103	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	100	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	39	%	AsureQuality Method (LC-MS/MS)
MPFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	102	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	103	%	AsureQuality Method (LC-MS/MS)

Blank

Relates to sample(s) 18-213406-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

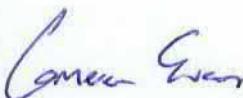
Test	Result	Unit	Method Reference
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	115	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS	113	%	AsureQuality Method (LC-MS/MS)
M4PFBA	125	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	114	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	121	%	AsureQuality Method (LC-MS/MS)
MPFHpA	115	%	AsureQuality Method (LC-MS/MS)
M8PFOA	119	%	AsureQuality Method (LC-MS/MS)
M9PFNA	117	%	AsureQuality Method (LC-MS/MS)
M6PFDA	114	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M7PFUnDA	106	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	98	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	136	%	AsureQuality Method (LC-MS/MS)
MPFOSA	118	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	119	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	134	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	120	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	131	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	123	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	133	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	130	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	126	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B AsureQuality Method (LC-MS/MS)			
di-PFhXS (1) = Concentration determined using a branched di-PFhXS isomer standard (399>80 transition)			
mono-PFhXS (1) = Concentration determined using a branched mono-PFhXS isomer standard (399>80 transition)			
L-PFhXS (1) = Concentration determined using the linear PFhXS isomer standard (399>80 transition)			
Total PFhXS (3) = The numerical sum of di-PFhXS (1), mono-PFhXS (1), and L-PFhXS (1)			
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)			
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)			
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)			
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)			
Sum PFhXS+PFOS (1) = The numerical sum of Total PFhXS (3) and Total PFOS (7)			
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.			
Reported results are corrected for internal standard recovery			
Any tests marked with * are not accredited for specific matrices or analytes.			
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.			
NR = Not Reportable			



Cameron Evans

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte LOR ($\mu\text{g}/\text{mL}$)

Listing applies to samples: 18-213406-2, 18-213406-5, 18-213406-6, 18-213406-7

Perfluoroalkylsulfonic acids

PFPrS*	0.0010
PFBS*	0.0010
PFPeS*	0.0010
di-PFhS (1)*	0.0010
mono-PFhS (1)*	0.0010
L-PFhS (1)*	0.0010
Total PFhS (3)*	0.0010
PFHpS*	0.0010
di-PFOS (5)*	0.0010
mono-PFOS (5)*	0.0010
L-PFOS (5)*	0.0010
Total PFOS (7)*	0.0010
Sum PFhS+PFOS (1)*	0.0010
PFNS*	0.0010
PFDS*	0.0010

Perfluoroalkylcarboxylic acids

PFBA*	0.0010
PFPeA*	0.0010
PFHxA*	0.0010
PFHpA*	0.0010
PFOA*	0.0010
PFNA*	0.0010
PFDA*	0.0010
PFUnDA*	0.0010
PFDoDA*	0.0010
PFTrDA*	0.0010
PFTeDA*	0.0010

Perfluorooctanesulfonamides

PFOSA*	0.0010
NEtFOSA-M*	0.0010
NMeFOSA-M*	0.0010

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA* 0.0010
NMeFOSAA* 0.0010

Perfluorooctanesulfonamidoethanols

NETFOSE-M* 0.0010
NMeFOSE-M* 0.0010

Telomere Sulfonic acids

4:2 FTS*	0.0010
6:2 FTS*	0.0010
8:2 FTS*	0.0010

Listing applies to samples: 18-213406-1, 18-213406-3, 18-213406-4, 18-213406-8

PFPrS	0.0010
PFBS	0.0010
PFPeS	0.0010

di-PFHxS (1)	0.0010
mono-PFHxS (1)	0.0010
L-PFHxS (1)	0.0010
Total PFHxS (3)	0.0010
PFHpS	0.0010
di-PFOS (5)	0.0010
mono-PFOS (5)	0.0010
L-PFOS (5)	0.0010
Total PFOS (7)	0.0010
Sum PFHxS+PFOS (1)	0.0010
PFNS	0.0010
PFDS	0.0010
Perfluoroalkylcarboxylic acids	
PFBA	NR
PPPeA	0.0010
PFHxA	0.0010
PFHpA	0.0010
PFOA	0.0010
PFNA	0.0010
PFDA	0.0010
PFUnDA	0.0010
PFDoDA	NR
PFTrDA	NR
PFTeDA	NR
Perfluoroctanesulfonamides	
PFOSA	0.0010
NEtFOSA-M	NR
NMeFOSA-M	NR
Perfluoroctanesulfonamidoacetic acids	
NEtFOSAA	0.0010
NMeFOSAA	0.0010
Perfluoroctanesulfonamidoethanols	
NEtFOSE-M	0.0010
NMeFOSE-M	0.0010
Telomere Sulfonic acids	
4:2 FTS	0.0010
6:2 FTS	0.0010
8:2 FTS	0.0010

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte Full Name

Listing applies to samples: 18-213406-2, 18-213406-5, 18-213406-6, 18-213406-7

Perfluoroalkylsulfonic acids

PFPrS*	Perfluoro-1-propanesulfonic acid
PFBS*	Perfluoro-1-butanesulfonic acid
PPPeS*	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)*	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)*	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)*	Linear Perfluorohexanesulfonic acid
PFHpS*	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)*	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)*	Total Perfluoromethylheptane sulfonic acids

Analyte	Full Name
L-PFOS (5)*	Linear Perfluorooctanesulfonic acid
PFNS*	Perfluoro-1-nonanesulfonic acid
PFDS*	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA*	Perfluoro-n-butanoic acid
PPPeA*	Perfluoro-n-pentanoic acid
PFHxA*	Perfluoro-n-hexanoic acid
PFHpA*	Perfluoro-n-heptanoic acid
PFOA*	Perfluoro-n-octanoic acid
PFNA*	Perfluoro-n-nonanoic acid
PFDA*	Perfluoro-n-decanoic acid
PFUnDA*	Perfluoro-n-undecanoic acid
PFDoDA*	Perfluoro-n-dodecanoic acid
PFTrDA*	Perfluoro-n-tridecanoic acid
PFTeDA*	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA*	Perfluoro-1-octanesulfonamide
NEtFOSA-M*	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M*	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA*	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA*	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M*	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS*	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS*	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS*	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS*	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS*	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS*	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA*	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PPPeA*	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA*	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA*	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA*	Perfluoro-n-[13C8]octanoic acid
M9PFNA*	Perfluoro-n-[13C9]nonanoic acid
M6PFDA*	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA*	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA*	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA*	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA*	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA*	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA*	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA*	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA*	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE*	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE*	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Analyte**Full Name**

Listing applies to samples: 18-213406-1, 18-213406-3, 18-213406-4, 18-213406-8

Perfluoroalkylsulfonic acids

PFPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

PFBA	Perfluoro-n-butanoic acid
PPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDoDA	Perfluoro-n-dodecanoic acid
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid

Perfluoroctanesulfonamides

PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide

Perfluoroctanesulfonamidoacetic acids

NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluoroctanesulfonamidoethanols

NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Food and Environmental Submission Form/Chain of Custody

Customer Details

Company Name: * Taranaki Regional Council
 Contact Person: * Callum Mackenzie
 Email: * callum.mackenzie@trc.govt.nz
 Contact Phone No.: * 06 765 7127

Address:

Submission Ref.:

Purchase Order No.: 73494

Contract/Quote No.:

Reporting Details

Report Results To: * sean.hudgens@aecom.com

Extra Copies To:

Report each sample separately? *

If multiple samples are listed below, tick yes
 to receive an individual CoA for each sample.

 Yes

 No

Sample Sent By (Name): * Rebecca Joyce Signed By: *

Date/Time Dispatched:

 Condition sample(s) dispatched in: Ambient Chilled Frozen

 Quarantine (include a copy of the MPI Import Permit/Transfer Form stating country of origin)

 Return sample(s) after analysis (Courier fees apply)

NOTE: Samples will be discarded/returned 8 weeks after reporting unless otherwise instructed.

 AQ to composite samples? Yes

 Are samples hazardous to health? * Yes No

 Water samples submitted? * Potable Non-Potable

Submission Label


18-212432
AsureQuality Limited

Wellington Laboratory

1C Quadrant Drive, Waiwhetu

Lower Hutt 5010

New Zealand

Tel: +64 4 570 8359

Email: GracefieldSR@asurequality.com

Urgency Details*
 Normal Turn-around-time (TAT)

 Urgent Service (please select from options below)

 Half quoted TAT (50% surcharge)

 Quarter quoted TAT (100% surcharge)

 NOTE: For urgent testing, please contact AQ prior to
 submitting samples to confirm availability.

Sample Name* (unique sample identifier)	Sample Type* (Type of product/substance/material E.g., Potable Water, Soil, Biota Product, Apple, Cow Liver, Apple, Honey, Spinach)	Sample Description (additional sample information, to appear on report)	Sampled Date (used to determine holding time, if applicable)	Testing Requirements* (test or compounds to be tested for)	AQ Ref. only
GW3	Groundwater	Groundwater	22/08/18	DX - PFCS01	
GW5					
GW8A					
GW10					
GW46					
GW47					
Control 02					

*Required information

Comments/Additional Information:

Received By (Name): * Lauren Mockett

 Signed By: * 

 7:30
 23/08/18
 14

 NZ Couriers

 LB 09801069

Certificate of Analysis

Final Report

Sean Hudgens
AECOM Consulting Services - Wellington
PO Box 27277
Wellington 6141
New Zealand

PO Number: 73494

Submitted by:
Taranaki Regional Council
Private Bag 713
Stratford 4352
New Zealand

Report Issued: 19-Sep-2018

AsureQuality Reference: 18-213132

Sample(s) Received: 24-Aug-2018 07:45

Results

The tests were performed on the samples as received.

Customer Sample Name: GWOMI

AsureQuality ID: 18-213132-1

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 23-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PPPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.039	µg/L	AsureQuality Method (LC-MS/MS)
PPPeA	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.032	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0046	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.014	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	98	%	AsureQuality Method (LC-MS/MS)
M8PFOS	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA	72	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	95	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	92	%	AsureQuality Method (LC-MS/MS)
M9PFNA	104	%	AsureQuality Method (LC-MS/MS)
M6PFDA	104	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	108	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	101	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	49	%	AsureQuality Method (LC-MS/MS)
MPFOSA	89	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	74	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	80	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	81	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	91	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	80	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	115	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: GW9AA

AsureQuality ID: 18-213132-2

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 23-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.077	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.020	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	0.12	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	102	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	90	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	93	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	109	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	110	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	103	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFDoDA *	102	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	111	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	90	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	95	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	103	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	120	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	115	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	124	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: GW9B

AsureQuality ID: 18-213132-3

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 23-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.0015	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0015	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0048	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0066	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0081	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.090	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.33	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.16	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.028	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.017	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	0.016	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.17	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	0.049	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	108	%	AsureQuality Method (LC-MS/MS)
M8PFOS	129	%	AsureQuality Method (LC-MS/MS)
M4PFBA	68	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA	113	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	121	%	AsureQuality Method (LC-MS/MS)
M6PFDA	127	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	113	%	AsureQuality Method (LC-MS/MS)
MPFDaDA	86	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	48	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	62	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	73	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	127	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	85	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	94	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	159 (R)	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	148	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: GW28 AsureQuality ID: 18-213132-4

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 23-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	0.015	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	0.015	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFHs *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	0.022	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	0.022	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHs+PFOS (1) *	0.037	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	0.074	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	0.052	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	0.018	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	101	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	99	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	110	%	AsureQuality Method (LC-MS/MS)
MPFHxA *	110	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	109	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	105	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	106	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	112	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	104	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSA *	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	98	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	96	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	103	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	117	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	113	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	112	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: GW29

AsureQuality ID: 18-213132-5

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 23-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.011	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.027	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.050	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.27	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.32	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0080	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0065	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.10	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.31	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.42	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.74	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.052	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.18	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.74	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.064	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.044	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.023	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	99	%	AsureQuality Method (LC-MS/MS)
M4PFBA	125	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	108	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	88	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA	88	%	AsureQuality Method (LC-MS/MS)
M6PFDA	94	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	80	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	56	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	48	%	AsureQuality Method (LC-MS/MS)
MPFOSA	87	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	50	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	68	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	127	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	83	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	102	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: QAQC08

AsureQuality ID: 18-213132-6

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 23-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.0015	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0015	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.0017	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
L-PFOS (5)	0.0045	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0062	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0077	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.091	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.33	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.028	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.017	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	0.016	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.17	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	0.050	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	103	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	127	%	AsureQuality Method (LC-MS/MS)
M4PFBA	61	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	94	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	98	%	AsureQuality Method (LC-MS/MS)
MPFHxA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	89	%	AsureQuality Method (LC-MS/MS)
M9PFNA	120	%	AsureQuality Method (LC-MS/MS)
M6PFDA	127	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	124	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	56	%	AsureQuality Method (LC-MS/MS)
MPFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	90	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	90	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	108	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNMeFOSAA	125	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	96	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	140	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	139	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 18-213132-1, 18-213132-3, 18-213132-5, 18-213132-6

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSAA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	100	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	100	%	AsureQuality Method (LC-MS/MS)
M4PFBA	100	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	100	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	100	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	100	%	AsureQuality Method (LC-MS/MS)
MPFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	100	%	AsureQuality Method (LC-MS/MS)

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Relates to sample(s) 18-213132-2, 18-213132-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PPPeS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)

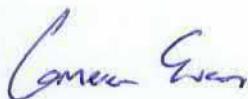
Test	Result	Unit	Method Reference
mono-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PPPeA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<5.0	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<1.0	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	102	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	104	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	109	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Cameron Evans
di-PFhS (1) = Concentration determined using a branched di-PFhS isomer standard (399>80 transition)			
mono-PFhS (1) = Concentration determined using a branched mono-PFhS isomer standard (399>80 transition)			
L-PFhS (1) = Concentration determined using the linear PFhS isomer standard (399>80 transition)			
Total PFhS (3) = The numerical sum of di-PFhS (1), mono-PFhS (1), and L-PFhS (1)			
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)			
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)			
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)			
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)			
Sum PFhS+PFOS (1) = The numerical sum of Total PFhS (3) and Total PFOS (7)			
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.			
Reported results are corrected for internal standard recovery			
Any tests marked with * are not accredited for specific matrices or analytes.			
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.			



Cameron Evans

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte **LOR (µg/L)**

Listing applies to samples: 18-213132-2, 18-213132-4

Perfluoroalkylsulfonic acids

PFPrS*	0.0010
PFBS*	0.0010
PFPeS*	0.0010
di-PFHxS (1)*	0.0010
mono-PFHxS (1)*	0.0010
L-PFHxS (1)*	0.0010
Total PFHxS (3)*	0.0010
PFHpS*	0.0010
di-PFOS (5)*	0.0010
mono-PFOS (5)*	0.0010
L-PFOS (5)*	0.0010
Total PFOS (7)*	0.0010
Sum PFHxS+PFOS (1)*	0.0010
PFNS*	0.0010
PFDS*	0.0010

Perfluoroalkylcarboxylic acids

PFBA*	0.0010
PFPeA*	0.0010
PFHxA*	0.0010
PFHpA*	0.0010
PFOA*	0.0010
PFNA*	0.0010
PFDA*	0.0010
PFUnDA*	0.0010
PFDoDA*	0.0010
PFTrDA*	0.0010
PFTeDA*	0.0010

Perfluorooctanesulfonamides

PFOSA*	0.0010
NEtFOSA-M*	0.0010
NMeFOSA-M*	0.0010

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA* 0.0010
NMeFOSAA* 0.0010

Perfluorooctanesulfonamidoethanols

NEtFOSE-M* 0.0010
NMeFOSE-M* 0.0010

Telomere Sulfonic acids

4:2 FTS*	0.0010
6:2 FTS*	0.0010
8:2 FTS*	0.0010

Listing applies to samples: 18-213132-1, 18-213132-3, 18-213132-5, 18-213132-6

PFPrS	0.0010
PFBS	0.0010
PFPeS	0.0010

di-PFHxS (1)	0.0010
mono-PFHxS (1)	0.0010
L-PFHxS (1)	0.0010
Total PFHxS (3)	0.0010
PFHpS	0.0010
di-PFOS (5)	0.0010
mono-PFOS (5)	0.0010
L-PFOS (5)	0.0010
Total PFOS (7)	0.0010
Sum PFHxS+PFOS (1)	0.0010
PFNS	0.0010
PFDS	0.0010
Perfluoroalkylcarboxylic acids	
PFBA	0.0010
PPPeA	0.0010
PFHxA	0.0010
PFHpA	0.0010
PFOA	0.0010
PFNA	0.0010
PFDA	0.0010
PFUnDA	0.0010
PFDoDA	0.0010
PFTrDA	0.0010
PFTeDA	0.0010
Perfluoroctanesulfonamides	
PFOSA	0.0010
NEtFOSA-M	0.0010
NMeFOSA-M	0.0010
Perfluoroctanesulfonamidoacetic acids	
NEtFOSAA	0.0010
NMeFOSAA	0.0010
Perfluoroctanesulfonamidoethanols	
NEtFOSE-M	0.0010
NMeFOSE-M	0.0010
Telomere Sulfonic acids	
4:2 FTS	0.0010
6:2 FTS	0.0010
8:2 FTS	0.0010

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte **Full Name**

Listing applies to samples: 18-213132-2, 18-213132-4

Perfluoroalkylsulfonic acids

PFPrS*	Perfluoro-1-propanesulfonic acid
PFBS*	Perfluoro-1-butanesulfonic acid
PPPeS*	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)*	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)*	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)*	Linear Perfluorohexanesulfonic acid
PFHpS*	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)*	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)*	Total Perfluoromethylheptane sulfonic acids

Analyte	Full Name
L-PFOS (5)*	Linear Perfluorooctanesulfonic acid
PFNS*	Perfluoro-1-nonanesulfonic acid
PFDS*	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA*	Perfluoro-n-butanoic acid
PPPeA*	Perfluoro-n-pentanoic acid
PFHxA*	Perfluoro-n-hexanoic acid
PFHpA*	Perfluoro-n-heptanoic acid
PFOA*	Perfluoro-n-octanoic acid
PFNA*	Perfluoro-n-nonanoic acid
PFDA*	Perfluoro-n-decanoic acid
PFUnDA*	Perfluoro-n-undecanoic acid
PFDoDA*	Perfluoro-n-dodecanoic acid
PFTrDA*	Perfluoro-n-tridecanoic acid
PFTeDA*	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA*	Perfluoro-1-octanesulfonamide
NEtFOSA-M*	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M*	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA*	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA*	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M*	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS*	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS*	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS*	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS*	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS*	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS*	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA*	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PPPeA*	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA*	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA*	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA*	Perfluoro-n-[13C8]octanoic acid
M9PFNA*	Perfluoro-n-[13C9]nonanoic acid
M6PFDA*	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA*	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA*	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA*	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA*	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA*	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA*	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA*	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA*	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE*	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE*	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Analyte**Full Name**

Listing applies to samples: 18-213132-1, 18-213132-3, 18-213132-5, 18-213132-6

Perfluoroalkylsulfonic acids

PFPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

PFBA	Perfluoro-n-butanoic acid
PPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDoDA	Perfluoro-n-dodecanoic acid
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid

Perfluoroctanesulfonamides

PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide

Perfluoroctanesulfonamidoacetic acids

NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluoroctanesulfonamidoethanols

NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxA	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable



Food and Environmental Submission Form/Chain of Custody

Customer Details

Company Name: * TARANAKI
 Contact Person: * Callum Mackenzie
 Email: * callum.mackenzie@trc.govt.nz
 Contact Phone No.: * 06 7657127

Address:

Submission Ref.:

Purchase Order No.: 73494

Contract/Quote No.:

Reporting Details

Report Results To: * sean.hudgens@ecom.com

Extra Copies To:

Report each sample separately? *

If multiple samples are listed below, tick yes
to receive an individual CoA for each sample. Yes No

Sample Sent By (Name): * REBECCA JOYCE

Signed By:

Date/Time Dispatched:

Condition sample(s) dispatched in: Ambient Chilled Frozen Quarantine (include a copy of the MPI Import Permit/Transfer Form stating country of origin) Return sample(s) after analysis (Courier fees apply)

NOTE: Samples will be discarded/returned 8 weeks after reporting unless otherwise instructed.

AQ to composite samples? YesAre samples hazardous to health? * Yes NoWater samples submitted? * Potable Non-Potable

Submission Label

18-213132

AsureQuality Limited

Wellington Laboratory

1C Quadrant Drive, Waiwhetu

Lower Hutt 5010

New Zealand

Tel: +64 4 570 8359

Email: GracefieldSR@asurequality.com

Urgency Details*

 Normal Turn-around-time (TAT) Urgent Service (please select from options below) Half quoted TAT (50% surcharge) Quarter quoted TAT (100% surcharge)NOTE: For urgent testing, please contact AQ prior to
submitting samples to confirm availability.

Sample Name* (unique sample identifier)	Sample Type* (Type of product/substance/material E.g., Potable Water, Soil, Biota Product, Apple, Cow Liver, Apple, Honey, Spinach)	Sample Description (additional sample information, to appear on report)	Sampled Date (used to determine holding time, if applicable)	Testing Requirements* (test or compounds to be tested for)	AQ Ref. only
GW0M1	GROUNDWATER	GROUNDWATER	23/8/18	HOLD COLD	
GW9AA					
GW9B					
GW28					
GW29					
QAQC08					
QAQC09					
QAQC10					

*Required information

Comments/Additional Information:

Received By (Name): * Lauren Mockett
Signed By: 7:45
24/08/18
16 CNZ Couriers
LB 09627766

Issue Date: February 2018

Certificate of Analysis

Final Report

Sean Hudgens
AECOM Consulting Services - Wellington
PO Box 27277
Wellington 6141
New Zealand

PO Number: 73494

Submitted by:
Taranaki Regional Council
Private Bag 713
Stratford 4352
New Zealand

Report Issued: 20-Sep-2018

AsureQuality Reference: **18-213620**

Sample(s) Received: 23-Aug-2018 07:30

Results

The tests were performed on the samples as received.

Customer Sample Name: QAQC01

AsureQuality ID: 18-213620-1

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)

AsureQuality has used reasonable skill, care, and effort to provide an accurate analysis of the sample(s) which form(s) the subject of this report. However, the accuracy of this analysis is reliant on, and subject to, the sample(s) provided by you and your responsibility as to transportation of the sample(s). AsureQuality's standard terms of business apply to the analysis set out in this report.

Test	Result	Unit	Method Reference
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	81	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	52	%	AsureQuality Method (LC-MS/MS)
M8PFOS	55	%	AsureQuality Method (LC-MS/MS)
M4PFBA	77	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	93	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	85	%	AsureQuality Method (LC-MS/MS)
MPFHpA	73	%	AsureQuality Method (LC-MS/MS)
M8PFOA	59	%	AsureQuality Method (LC-MS/MS)
M9PFNA	58	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	87	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	88	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	62	%	AsureQuality Method (LC-MS/MS)
MPFOSA	73	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	80	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	78	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	69	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	70	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	76	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	77	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	60	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	58	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: QAQC04

AsureQuality ID: 18-213620-4

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 21-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PPPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	87	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	74	%	AsureQuality Method (LC-MS/MS)
M8PFOS	74	%	AsureQuality Method (LC-MS/MS)
M4PFBA	96	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	92	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	87	%	AsureQuality Method (LC-MS/MS)
MPFHpA	83	%	AsureQuality Method (LC-MS/MS)
M8PFOA	78	%	AsureQuality Method (LC-MS/MS)
M9PFNA	73	%	AsureQuality Method (LC-MS/MS)
M6PFDA	71	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	85	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFDoDA	82	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	87	%	AsureQuality Method (LC-MS/MS)
MPFOSA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	88	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	72	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	77	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	75	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	82	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	83	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	87	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	65	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	73	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: QAQC05

AsureQuality ID: 18-213620-5

Sample Description: Groundwater

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSA-M *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	112	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA *	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	111	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	116	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	107	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	111	%	AsureQuality Method (LC-MS/MS)
MPFDaDA *	113	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	103	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA *	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	116	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	107	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	110	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	112	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	106	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Duplicate of 18-213620-5A

AsureQuality ID: 18-213620-8

Sample Description: QAQC05

Sample Condition: Acceptable

Sampled Date: 22-Aug-2018

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PPeS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFHs *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHs+PFOS (1) *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA *	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA *	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M *	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS *	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS *	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS *	111	%	AsureQuality Method (LC-MS/MS)
M8PFOS *	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA *	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA *	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA *	106	%	AsureQuality Method (LC-MS/MS)
MPFHxA *	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA *	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA *	110	%	AsureQuality Method (LC-MS/MS)
M6PFDA *	115	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA *	107	%	AsureQuality Method (LC-MS/MS)
MPFDoDA *	119	%	AsureQuality Method (LC-MS/MS)
MPFTeDA *	117	%	AsureQuality Method (LC-MS/MS)
MPFOSA *	108	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSA *	110	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA *	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA *	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA *	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE *	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE *	114	%	AsureQuality Method (LC-MS/MS)
M4:2FTS *	107	%	AsureQuality Method (LC-MS/MS)
M6:2FTS *	108	%	AsureQuality Method (LC-MS/MS)
M8:2FTS *	105	%	AsureQuality Method (LC-MS/MS)

QC Results

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Relates to sample(s) 18-213620-1, 18-213620-4

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
NMeFOSA-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	90	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	72	%	AsureQuality Method (LC-MS/MS)
M8PFOS	66	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	96	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	94	%	AsureQuality Method (LC-MS/MS)
MPFHpA	86	%	AsureQuality Method (LC-MS/MS)
M8PFOA	76	%	AsureQuality Method (LC-MS/MS)
M9PFNA	70	%	AsureQuality Method (LC-MS/MS)
M6PFDA	71	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	84	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	94	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	86	%	AsureQuality Method (LC-MS/MS)
MPFOSA	85	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	69	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	64	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	83	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	83	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)

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Relates to sample(s) 18-213620-5, 18-213620-8

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Total PFHxS (3)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	<0.010	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFDA	<0.050	µg/L	AsureQuality Method (LC-MS/MS)
PFUnDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFDoDA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamides			
PFOSA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NEtFOSA-M	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSA-M	<0.20	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoacetic acids			
NEtFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroctanesulfonamidoethanols			
NEtFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSE-M	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Telomere Sulfonic acids			
4:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
8:2 FTS	<0.10	µg/L	AsureQuality Method (LC-MS/MS)
Internal Standards			
M3PFBS	109	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	113	%	AsureQuality Method (LC-MS/MS)
M8PFOS	113	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	112	%	AsureQuality Method (LC-MS/MS)
M9PFNA	112	%	AsureQuality Method (LC-MS/MS)
M6PFDA	114	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M7PFUnDA	112	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	104	%	AsureQuality Method (LC-MS/MS)
MPFOSA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	111	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	112	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	112	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	116	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Water			
DX-PFCS01, 03-SUITE_B AsureQuality Method (LC-MS/MS)			
di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)			
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)			
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)			
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)			
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)			
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)			
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)			
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)			
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)			
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.			
Reported results are corrected for internal standard recovery			

Any tests marked with * are not accredited for specific matrices or analytes.

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.



Cameron Evans

Scientist

Accreditation



Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte **LOR (µg/L)**

Listing applies to samples: 18-213620-5, 18-213620-8

Perfluoroalkylsulfonic acids

PFPrS*	0.0010
PFBS*	0.0010
PFPeS*	0.0010
di-PFHxS (1)*	0.0010
mono-PFHxS (1)*	0.0010
L-PFHxS (1)*	0.0010
Total PFHxS (3)*	0.0010
PFHpS*	0.0010
di-PFOS (5)*	0.0010
mono-PFOS (5)*	0.0010
L-PFOS (5)*	0.0010
Total PFOS (7)*	0.0010
Sum PFHxS+PFOS (1)*	0.0010
PFNS*	0.0010
PFDS*	0.0010

Perfluoroalkylcarboxylic acids

PFBA*	0.0010
PFPeA*	0.0010
PFHxA*	0.0010
PFHpA*	0.0010
PFOA*	0.0010
PFNA*	0.0010
PFDA*	0.0010
PFUnDA*	0.0010
PFDoDA*	0.0010
PFTrDA*	0.0010
PFTeDA*	0.0010

Perfluorooctanesulfonamides

PFOSA*	0.0010
NETFOSA-M*	0.0010
NMeFOSA-M*	0.0010

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA* 0.0010
NMeFOSAA* 0.0010

Perfluorooctanesulfonamidoethanols

NEtFOSE-M* 0.0010
NMeFOSE-M* 0.0010

Telomere Sulfonic acids

4:2 FTS*	0.0010
6:2 FTS*	0.0010
8:2 FTS*	0.0010

Listing applies to samples: 18-213620-1, 18-213620-4

PFPrS	0.0010
PFBS	0.0010
PFPeS	0.0010

di-PFHxS (1)	0.0010
mono-PFHxS (1)	0.0010
L-PFHxS (1)	0.0010
Total PFHxS (3)	0.0010
PFHpS	0.0010
di-PFOS (5)	0.0010
mono-PFOS (5)	0.0010
L-PFOS (5)	0.0010
Total PFOS (7)	0.0010
Sum PFHxS+PFOS (1)	0.0010
PFNS	0.0010
PFDS	0.0010
Perfluoroalkylcarboxylic acids	
PFBA	0.0010
PPPeA	0.0010
PFHxA	0.0010
PFHpA	0.0010
PFOA	0.0010
PFNA	0.0010
PFDA	0.0010
PFUnDA	0.0010
PFDoDA	0.0010
PFTrDA	0.0010
PFTeDA	0.0010
Perfluoroctanesulfonamides	
PFOSA	0.0010
NEtFOSA-M	0.0010
NMeFOSA-M	0.0010
Perfluoroctanesulfonamidoacetic acids	
NEtFOSAA	0.0010
NMeFOSAA	0.0010
Perfluoroctanesulfonamidoethanols	
NEtFOSE-M	0.0010
NMeFOSE-M	0.0010
Telomere Sulfonic acids	
4:2 FTS	0.0010
6:2 FTS	0.0010
8:2 FTS	0.0010

Analyte Definitions

Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
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Listing applies to samples: 18-213620-5, 18-213620-8

Perfluoroalkylsulfonic acids

PFPrS*	Perfluoro-1-propanesulfonic acid
PFBS*	Perfluoro-1-butanesulfonic acid
PPPeS*	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)*	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)*	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)*	Linear Perfluorohexanesulfonic acid
PFHpS*	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)*	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)*	Total Perfluoromethylheptane sulfonic acids

Analyte	Full Name
L-PFOS (5)*	Linear Perfluorooctanesulfonic acid
PFNS*	Perfluoro-1-nonanesulfonic acid
PFDS*	Perfluoro-1-decanesulfonic acid
Perfluoroalkylcarboxylic acids	
PFBA*	Perfluoro-n-butanoic acid
PPPeA*	Perfluoro-n-pentanoic acid
PFHxA*	Perfluoro-n-hexanoic acid
PFHpA*	Perfluoro-n-heptanoic acid
PFOA*	Perfluoro-n-octanoic acid
PFNA*	Perfluoro-n-nonanoic acid
PFDA*	Perfluoro-n-decanoic acid
PFUnDA*	Perfluoro-n-undecanoic acid
PFDoDA*	Perfluoro-n-dodecanoic acid
PFTrDA*	Perfluoro-n-tridecanoic acid
PFTeDA*	Perfluoro-n-tetradecanoic acid
Perfluorooctanesulfonamides	
PFOSA*	Perfluoro-1-octanesulfonamide
NEtFOSA-M*	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M*	N-methylperfluoro-1-octanesulfonamide
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA*	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA*	N-methylperfluoro-1-octanesulfonamidoacetic acid
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M*	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M*	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol
Telomere Sulfonic acids	
4:2 FTS*	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS*	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS*	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid
Internal Standards	
M3PFBS*	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS*	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS*	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA*	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PPPeA*	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA*	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA*	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA*	Perfluoro-n-[13C8]octanoic acid
M9PFNA*	Perfluoro-n-[13C9]nonanoic acid
M6PFDA*	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA*	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA*	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA*	Perfluoro-n-[1,2-13C2]tetradecanoic acid
MPFOSA*	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA*	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA*	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA*	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA*	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE*	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE*	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS*	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Analyte **Full Name**

Listing applies to samples: 18-213620-1, 18-213620-4

Perfluoroalkylsulfonic acids

PFPrS	Perfluoro-1-propanesulfonic acid
PFBS	Perfluoro-1-butanesulfonic acid
PPeS	Perfluoro-1-pentanesulfonic acid
di-PFHxS (1)	Total Perfluorodimethylbutane sulfonic acids
mono-PFHxS (1)	Total Perfluoromethylpentane sulfonic acids
L-PFHxS (1)	Linear Perfluorohexanesulfonic acid
PFHpS	Perfluoro-1-heptanesulfonic acid
di-PFOS (5)	Total Perfluorodimethylhexane sulfonic acids
mono-PFOS (5)	Total Perfluoromethylheptane sulfonic acids
L-PFOS (5)	Linear Perfluooctanesulfonic acid
PFNS	Perfluoro-1-nonanesulfonic acid
PFDS	Perfluoro-1-decanesulfonic acid

Perfluoroalkylcarboxylic acids

PFBA	Perfluoro-n-butanoic acid
PPeA	Perfluoro-n-pentanoic acid
PFHxA	Perfluoro-n-hexanoic acid
PFHpA	Perfluoro-n-heptanoic acid
PFOA	Perfluoro-n-octanoic acid
PFNA	Perfluoro-n-nonanoic acid
PFDA	Perfluoro-n-decanoic acid
PFUnDA	Perfluoro-n-undecanoic acid
PFDoDA	Perfluoro-n-dodecanoic acid
PFTrDA	Perfluoro-n-tridecanoic acid
PFTeDA	Perfluoro-n-tetradecanoic acid

Perfluorooctanesulfonamides

PFOSA	Perfluoro-1-octanesulfonamide
NEtFOSA-M	N-ethylperfluoro-1-octanesulfonamide
NMeFOSA-M	N-methylperfluoro-1-octanesulfonamide

Perfluorooctanesulfonamidoacetic acids

NEtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid

Perfluorooctanesulfonamidoethanols

NEtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol
NMeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

Telomere Sulfonic acids

4:2 FTS	1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid
6:2 FTS	1H,1H,2H,2H-perfluoro-1-octanesulfonic acid
8:2 FTS	1H,1H,2H,2H-perfluoro-1-decanesulfonic acid

Internal Standards

M3PFBS	Perfluoro-1-[2,3,4-13C3]butanesulfonic acid
M3PFHxS	Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid
M8PFOS	Perfluoro-1-[13C8]octanesulfonic acid
M4PFBA	Perfluoro-n-[1,2,3,4-13C4]butanoic acid
M5PFPeA	Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid
M5PFHxA	Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid
MPFHpA	Perfluoro-n-[1,2,3,4-13C4]heptanoic acid
M8PFOA	Perfluoro-n-[13C8]octanoic acid
M9PFNA	Perfluoro-n-[13C9]nonanoic acid
M6PFDA	Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid
M7PFUnDA	Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid
MPFDoDA	Perfluoro-n-[1,2-13C2]dodecanoic acid
MPFTeDA	Perfluoro-n-[1,2-13C2]tetradecanoic acid

Analyte	Full Name
MPFOSA	Perfluoro-1-[13C8]octanesulfonamide
DNEtFOSA	N-ethyl-D5-perfluoro-1-octanesulfonamide
DNMeFOSA	N-methyl-D3-perfluoro-1-octanesulfonamide
DNEtFOSAA	N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid
DNMeFOSAA	N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid
DNEtFOSE	2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol
DNMeFOSE	2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol
M4:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid
M6:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid
M8:2FTS	1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting

LOD = Limit of Detection

NR = Not Reportable

Food and Environmental Submission Form/Chain of Custody

Customer Details

Company Name: * Taranaki Regional Council
 Contact Person: * Callum Mackenzie
 Email: * callum.mackenzie@trc.govt.nz
 Contact Phone No.: * 06 765 7127
 Address:

Submission Ref.:
 Purchase Order No.: 73494
 Contract/Quote No.:

Reporting Details

Report Results To: * sean.hudgens@aecom.com

Extra Copies To:

Report each sample separately? *

If multiple samples are listed below, tick yes
 to receive an individual CoA for each sample.

Yes

No

Sample Sent By (Name): * Rebecca Joyce Signed By: *

Date/Time Dispatched:

Condition sample(s) dispatched in: Ambient Chilled Frozen

Quarantine (include a copy of the MPI Import Permit/Transfer Form stating country of origin)

Return sample(s) after analysis (Courier fees apply)

NOTE: Samples will be discarded/returned 8 weeks after reporting unless otherwise instructed.

AQ to composite samples? Yes

Are samples hazardous to health? * Yes No

Water samples submitted? * Potable Non-Potable

Submission Label

 18-212400

AsureQuality Limited

Wellington Laboratory
 1C Quadrant Drive, Waiwhetu
 Lower Hutt 5010
 New Zealand
 Tel: +64 4 570 8359
 Email: GracefieldSR@asurequality.com

Urgency Details*

Normal Turn-around-time (TAT)
 Urgent Service (please select from options below)
 Half quoted TAT (50% surcharge)
 Quarter quoted TAT (100% surcharge)

NOTE: For urgent testing, please contact AQ prior to
 submitting samples to confirm availability.

Sample Name* (unique sample identifier)	Sample Type* (Type of product/substance/material E.g. Potable Water, Soil, Biota Product, Apple, Cow Liver, Apple, Honey, Spinach)	Sample Description (additional sample information, to appear on report)	Sampled Date (used to determine holding time, if applicable)	Testing Requirements* (test or compounds to be tested for)	AQ Ref. only
QAQC01	Groundwater	Groundwater	21/08/18	DX - PFCS01	
QAQC02					
QAQC03					
QAQC04					
QAQC05					
QAQC06					
QAQC07			22/08/18		

*Required information

Comments/Additional Information:

Received By (Name): * Lauren Mackett
 Signed By: * 

7:30
 23/08/18
 14  NZ Couriers
 LB 09801069